



**SEW**  
**EURODRIVE**



# **Explosion-Proof CMP40/50/63 Synchronous Servomotors**

Edition 07/2008

11661410 / EN

## **Operating Instructions**





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## 1 General Information

### 1.1 How to use the operating instructions

The operating instructions are an integral part of the product and contain important information on operation and service. The operating instructions are written for all employees who assemble, install, startup, and service this product.

The operating instructions must be accessible and legible. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. Consult SEW-EURODRIVE if you have any questions or if you require further information.

### 1.2 Structure of the safety notes

The safety notes in these operating instructions are structured as follows:

| Symbol                                                                            |  <b>SIGNAL WORD!</b>                                                                  |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Nature and source of hazard.</p> <p>Possible consequence(s) if disregarded.</p> <ul style="list-style-type: none"> <li>• Measure(s) to avoid the hazard.</li> </ul> |

| Symbol                                                                                                                                                                                                                                                    | Signal word                                                                                                                                                                                                                                                                                                                     | Meaning                                                                                        | Consequences if disregarded                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <p>Example:</p>  <p>General hazard</p>  <p>Specific hazard, e.g. electric shock</p> | <p> <b>HAZARD!</b></p> <p> <b>WARNING!</b></p> <p> <b>CAUTION!</b></p> | <p>Imminent hazard</p> <p>Possible hazardous situation</p> <p>Possible hazardous situation</p> | <p>Severe or fatal injuries</p> <p>Severe or fatal injuries</p> <p>Minor injuries</p> |
|                                                                                                                                                                        | <b>NOTE ON EXPLOSION PROTECTION</b>                                                                                                                                                                                                                                                                                             | Important note on explosion protection                                                         | Suspension of explosion protection and resulting dangers                              |
|                                                                                                                                                                        | <b>STOP!</b>                                                                                                                                                                                                                                                                                                                    | Possible damage to property                                                                    | Damage to the drive system or its environment                                         |
|                                                                                                                                                                        | <b>NOTE</b>                                                                                                                                                                                                                                                                                                                     | Useful information or tip. Simplifies handling of the drive system.                            |                                                                                       |

**1.3 Rights to claim under limited warranty**

Adhering to the operating instructions is a prerequisite for fault-free operation and the fulfillment of any right to claim under warranty. Read the operating instructions before you start working with the unit.

Make sure that the operating instructions are available to persons responsible for the system and its operation as well as to persons who work independently on the unit. You must also ensure that the documentation is legible.

**1.4 Exclusion of liability**

You must comply with the information contained in these operating instructions to ensure safe operation of the explosion-proof electric motors and to achieve the specified product characteristics and performance requirements. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.

**1.5 Product names and trademarks**

The brands and product names in these operating instructions are trademarks or registered trademarks of the titleholders.

**1.6 Copyright notice**

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## 2 Safety Notes

### 2.1 Preface

The following basic safety notes are intended to prevent injury to persons and damage to property. The operator must make sure that the basic safety notes are read and observed. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, please contact SEW-EURODRIVE.

### 2.2 General information



#### **! HAZARD!**

Servomotors, gearmotors and gear units may have live, uninsulated, and sometimes moving or rotating parts as well as hot surfaces during operation.

Explosive gas mixtures or concentrations of dust can lead to severe or fatal injuries in conjunction with hot, live and moving parts of electrical machinery.

Removing covers without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property.

#### **Severe or fatal injuries.**

- All work related to transportation, storage, setup/mounting, connection, startup, maintenance and repair may only be carried out by qualified personnel, in strict observation of:
  - The relevant detailed operating instructions
  - The warning and safety signs on the servomotor/gearmotor
  - All other project planning documents, operating instructions and wiring diagrams belonging to the drive
  - The specific regulations and requirements for the system
  - National / regional regulations governing safety and the prevention of accidents
- Never install or start up damaged products
- Immediately report any damages to the shipping company
- De-energize all power, brake and signal cables and stop the servomotor before removing the power and signal connectors.



### **2.3 Target group**

Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in this context are persons who are familiar with the setup, mechanical installation, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- Completed apprenticeship in the field of mechanical engineering (e.g. mechanic or mechatronic technician).
- They are familiar with these operating instructions.

Any electric work may only be performed by adequately qualified personnel. Qualified electricians in this context are persons who are familiar with the electronic installation, startup, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- Completed apprenticeship in the field of electrical engineering (e.g. electric or mechatronic technician).
- They are familiar with these operating instructions.

All activity in the other areas of transportation, storage, operation, and disposal must be carried out by persons who are appropriately trained.

### **2.4 Hot surfaces**

Servomotors can have a surface temperature of more than 100 °C during normal operation. Never touch the servomotor during operation or in the cool down phase once the it has been switched off.



## **2.5 Designated use**

The designated use refers to the procedure specified in the operating instructions.

Explosion-proof CMP synchronous servomotors are drive motors designed for use in industrial and commercial systems. Motor loads other than those specified and areas of application other than industrial and commercial systems should only be used after consultation with SEW-EURODRIVE.

Do not take the unit into operation until you have established that the end product complies with the EC Machinery Directive 98/37/EC.

The explosion-proof CMP synchronous servomotors comply with the applicable standards and regulations:

- Low voltage directive 2006/95/EC
- guideline 94/9/EC
- EN 61241-0 Electrical apparatus for use in atmospheres containing combustible dust: General requirements
- EN 61241-1 Electrical apparatus for use in atmospheres containing combustible dust: Protection through housing "tD"
- EN 60079-0 electrical apparatus for potentially explosive atmospheres: General requirements
- EN 60034 Rotating electrical machines
- EN 60079-15 Design, testing and designation of electric equipment in protection type 'n'.

Technical data and information on the permitted conditions are given on the nameplate and in the documentation; they have to be observed under all circumstances.

## **2.6 Other applicable documentation**

The following publications and documents have to be observed as well:

- Operating instructions 'Explosion-Proof Gear Units R..7, F..7, K..7, S..7 Series, Spiroplan® W' or operating instructions 'Explosion-Proof Gear Units BS.F, PS.F Series' for gearmotors
- Operating instructions of the inverter for servomotors powered by inverters
- Operating instructions of installed options, if applicable
- Corresponding wiring diagrams



### **2.7 Transport/storage**

Follow the instructions on transportation, storage and proper handling. Comply with the requirements for climatic conditions stated in section 'Technical Data'.

Inspect the shipment immediately upon receipt for any damage that may have occurred during transportation. Inform the shipping company immediately. If you notice any transport damage, do not startup the servomotor, but contact the SEW-EURODRIVE Service.

Remove securing devices used for transportation prior to startup.

Tighten installed transportation eyebolts. They are only designed for the weight of the servomotor / gearmotor; do not attach any additional loads.

The installed lifting eyebolts comply with DIN 580. The loads and regulations specified in this standard must always be observed. If the gearmotor has 2 suspension eye lugs or lifting eyebolts, then you should also use both suspension eye lugs for attaching transport ropes. In this case, the tension force vector of the slings must not exceed a 45° angle in accordance with DIN 580.

Store the servomotor in a dry, dust-free environment if it is not to be installed straight away.

### **2.8 Mounting/installation**

Observe the instructions in section 4, "Mechanical Installation" and section 5, "Electrical Installation".

The units must be installed and cooled according to the regulations and specifications in the corresponding documentation.

Protect the synchronous servomotors from excessive strain. Ensure that components are not deformed, particularly during transportation and handling.

The following application is prohibited unless the unit is explicitly designed for such use:

- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.



## **2.9 Electrical connection**

Perform electrical installation according to the pertinent regulations (e.g. cable cross sections, fusing, protective conductor connection). Additional information is contained in the documentation.

Observe the wiring information and differing data on the nameplate.

Observe the instructions in section 5, "Electrical Installation".

## **2.10 Startup/operation**

Whenever changes to normal operation occur, such as increased temperatures, noise, vibrations, determine the cause and consult the manufacturer

Refer to the information in section 6, "Startup".

## **2.11 Inspection/maintenance**

For more information, refer to section 9 "Inspection" "Maintenance".

## **2.12 Disposal**

**This product consists of:**

- Iron
- Aluminum
- Copper
- Plastic
- Electronic components

**Dispose of all components in accordance with applicable regulations.**



## 3 Scope of Delivery and Motor Design

### 3.1 Scope of delivery for SEW-EURODRIVE motors

|  |                                                                                                                           |
|--|---------------------------------------------------------------------------------------------------------------------------|
|  | <b>NOTE</b>                                                                                                               |
|  | Note the operating instructions of the used gear unit as well with respect to the scope of delivery and project planning. |

The scope of delivery for SEW-EURODRIVE servomotors includes for **standard motors**:

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Delivery with order confirmation</b> | <ul style="list-style-type: none"> <li>1 x Operating instructions in the language of the corresponding country, if requested. When ordering several servo gear units, the customer can reduce the number of operating instructions.</li> <li>1 x Safety notes for startup, if requested</li> <li>1 x Spare parts list if requested</li> </ul>                                                             |
| <b>Delivery with drive</b>              | 1 x Motor according to order confirmation                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Prefabricated cable</b>              | 1 x Bag with loose parts including conductor end sleeves and cable lugs for connection to SEW-EURODRIVE inverters.                                                                                                                                                                                                                                                                                        |
| <b>Plug connectors</b>                  | <ul style="list-style-type: none"> <li>1 x Encoder connector (radial or axial)</li> <li>10 x Crimp socket contacts for encoder connector for core cross sections of 0.25 mm<sup>2</sup> to 0.5 mm<sup>2</sup>.</li> <li>1 x SM50 mating connector for motor power cable</li> <li>4 x Crimp socket contacts for power connection for core cross sections of 1.5, 2.5, 4, 6 or 10 mm<sup>2</sup></li> </ul> |



The scope of delivery for SEW-EURODRIVE servomotors includes for **brakemotors**:

|                                         |      |                                                                                                                                                                                          |
|-----------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Delivery with order confirmation</b> | 1 x  | Operating instructions in the language of the corresponding country, if requested. When ordering several servo gear units, the customer can reduce the number of operating instructions. |
|                                         | 1 x  | Safety notes for startup, if requested                                                                                                                                                   |
|                                         | 1 x  | Spare parts list if requested                                                                                                                                                            |
| <b>Delivery with drive</b>              | 1 x  | Motor according to order confirmation                                                                                                                                                    |
| <b>Prefabricated cable</b>              | 1 x  | Bag with loose parts including conductor end sleeves and cable lugs for connection to SEW-EURODRIVE inverters                                                                            |
| <b>Brake</b>                            | 1 x  | AC-operated BME brake rectifier for DIN rail mounting, or alternatively:<br>- BMP, BMH or BMK brake rectifier<br>- BSG brake controller at a voltage of DC 24 V                          |
|                                         | 1 x  | Manual release lever if brake with manual release was ordered                                                                                                                            |
|                                         |      |                                                                                                                                                                                          |
| <b>Plug connectors</b>                  | 1 x  | Encoder connector (radial or axial)                                                                                                                                                      |
|                                         | 10 x | Crimp socket contacts for encoder connector for core cross sections of 0.25 mm <sup>2</sup> to 0.5 mm <sup>2</sup>                                                                       |
|                                         | 1 x  | SB50 mating connector for motor power and brake cable                                                                                                                                    |
|                                         | 4 x  | Crimp socket contacts for power connection for core cross sections of 1.5, 2.5, 4, 6 or 10 mm <sup>2</sup>                                                                               |
|                                         | 3 x  | Crimp socket contacts for brake connection for core cross sections of 1 mm <sup>2</sup> or 1.5 mm <sup>2</sup>                                                                           |

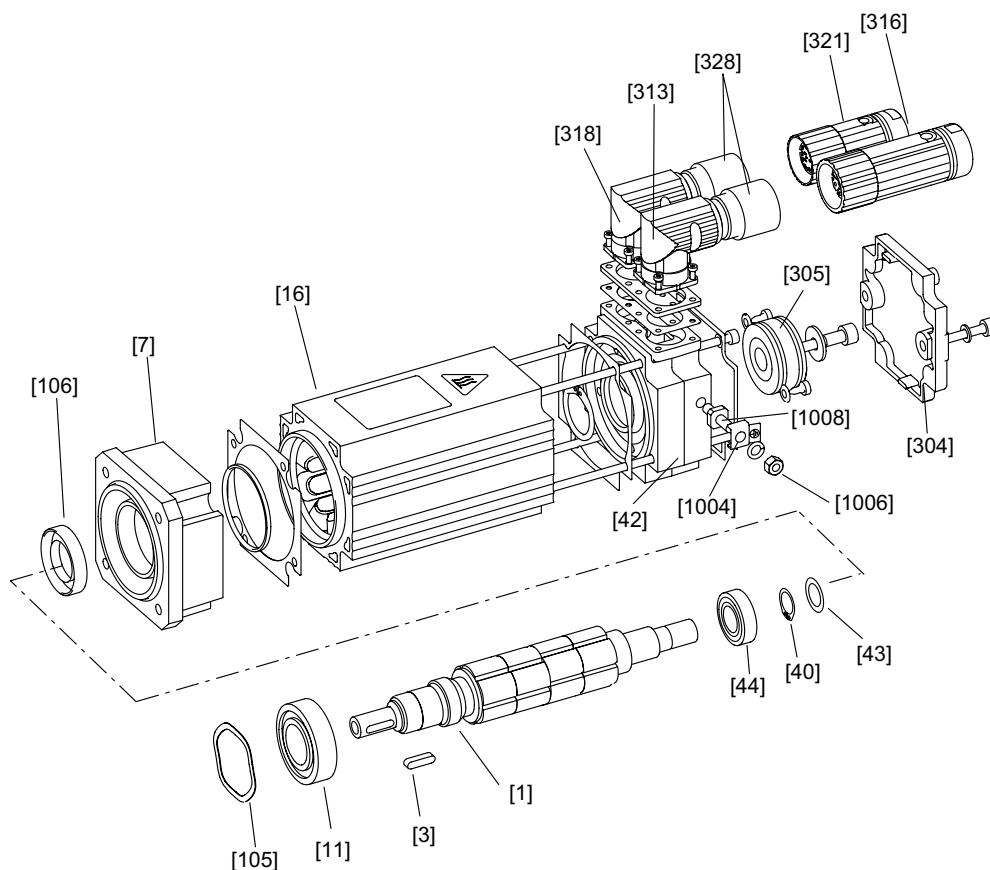


#### 3.2 Explosion-proof CMP synchronous servomotor basic structure



#### NOTE

The following illustration is intended to explain the basic structure of the unit. Its only purpose is to facilitate the assignment of components to the spare parts lists. Differences are possible depending on the motor size and design.



63193AXX

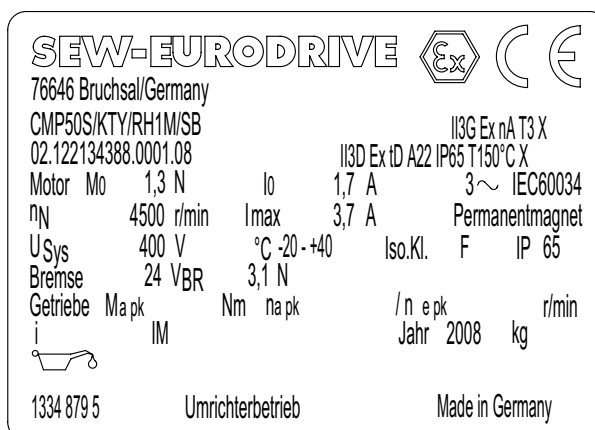
|       |                          |        |                         |
|-------|--------------------------|--------|-------------------------|
| [1]   | Rotor                    | [304]  | Housing cover           |
| [3]   | Key                      | [305]  | Resolver                |
| [7]   | Flanged endshield        | [313]  | Flange socket           |
| [11]  | Deep groove ball bearing | [318]  | Flange socket           |
| [16]  | Stator                   | [316]  | Complete plug connector |
| [40]  | Circlip                  | [321]  | Complete plug connector |
| [42]  | B-side endshield         | [328]  | Protection cap          |
| [43]  | Supporting ring          | [1004] | Terminal clip           |
| [44]  | Deep groove ball bearing | [1006] | Hex nut                 |
| [105] | Shim washer              | [1008] | Ground stud             |
| [106] | Oil seal                 |        |                         |



### 3.3 Nameplate and unit designation

#### 3.3.1 Nameplate on the servomotor

**Example: Nameplate of the explosion-proof CMP synchronous servomotor**



63147AXX

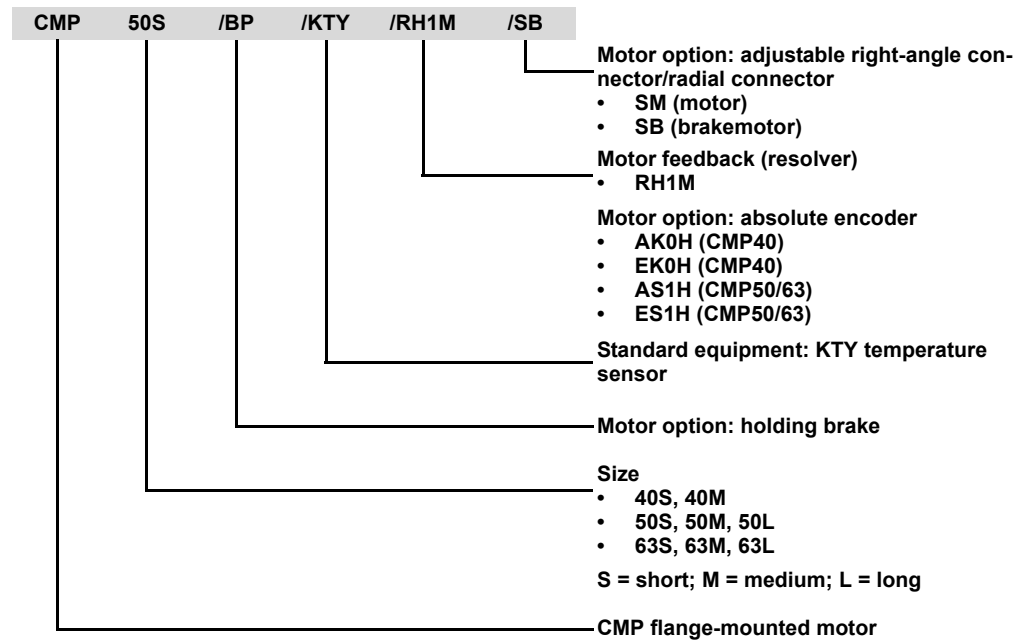
The nameplate is attached to the servomotor as illustrated in the following figure.



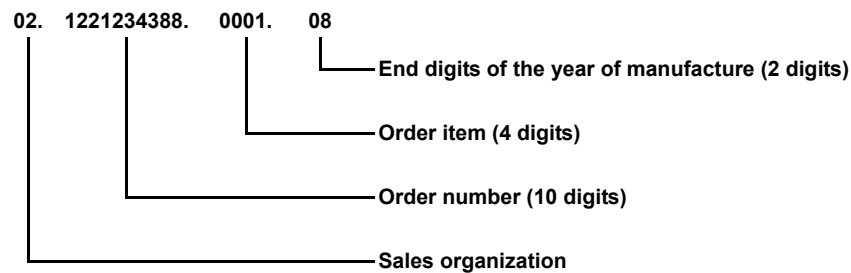
58810AXX



#### 3.3.2 CMP servomotor unit designation



#### 3.3.3 Serial number





## 4 Mechanical Installation

|                                                                                   |                                                                   |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------|
|  | <b>CAUTION!</b>                                                   |
|                                                                                   | <p>Observe the safety notes in section 2 during installation.</p> |

### 4.1 Required tools/resources

- Standard tools
- Mounting device
- Operation with conductor end sleeves: Crimping tool and conductor end sleeves
- Crimping tool for plug connectors in case customers want to assemble cables themselves
- Removal tool

### 4.2 Before you start

Do only install the servomotor if the following conditions are met:

- The specifications on the nameplate of the servomotor correspond to the supply system (line-powered drive) or the output voltage of the servo inverter (inverter-powered drive).
- The drive is undamaged (no damage caused by transportation or storage)
- The ambient temperature corresponds to the information on the nameplate and on the order confirmation.
- The surrounding area is free from oils, acids, gases, vapors, (ionizing) radiation, etc.
- The installation altitude must be no higher than 1000 m above MSL, otherwise the drive must be designed to meet the special environmental conditions. In case of deviations, see nameplate/order confirmation.

### 4.3 Preliminary

Thoroughly clean the shaft ends and make sure that they are free from anti-corrosion agent, dirt or the like. Use a commercially available solvent. Make sure that the solvent does not come into contact with the bearing or sealing rings as it may damage the material.

|                                                                                     |                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>STOP!</b>                                                                                                                                                                                                                        |
|                                                                                     | <p>The bearing and the sealing rings can be damaged if exposed to solvents.<br/>Possible material damages!</p> <ul style="list-style-type: none"> <li>• Protect the bearing and sealing rings from exposure to solvents.</li> </ul> |



### 4.3.1 Long-term storage of servomotors

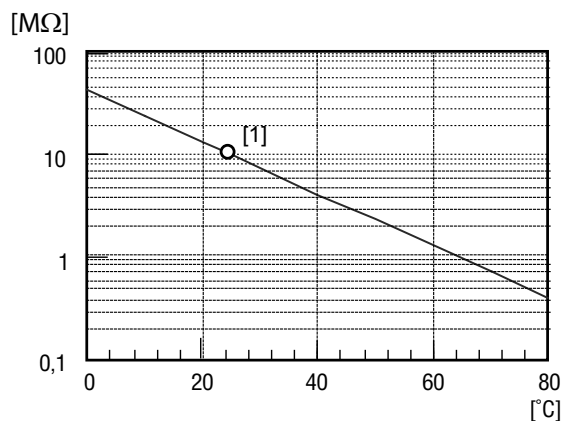
- The service life of the ball bearing grease is reduced after storage periods exceeding one year.
- Check whether the servomotor has absorbed moisture as a result of being stored for a long time. Measure the insulation resistance with a measurement voltage of DC 500 V.



#### NOTE

The insulation resistance varies greatly depending on the temperature, see following figure. You can measure the insulation resistance between the connection pins and the motor housing using an insulation measuring device.

The following figure shows the insulation resistance depending on the temperature.



53725AXX

[1] Resistance/temperature point (RT point)

### 4.3.2 Insulation resistance too low



#### NOTE

##### Insulation resistance too low:

Servomotor has absorbed moisture.

Measure: Send the servomotor to SEW-EURODRIVE Service with a description of the error.



## 4.4 Installing the servomotor

### 4.4.1 Aligning the motor shaft

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>STOP!</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                   | <p>Improper installation may result in damages to the servomotor.<br/>Potential damage to property!</p> <ul style="list-style-type: none"> <li>• Mount the servomotor only in the specified mounting position on a level, vibration-free, and torsionally rigid support structure.</li> <li>• Align the servomotor and the driven machine carefully to avoid placing any unacceptable strain on the output shafts.</li> <li>• Permitted overhung loads and axial forces (see page 50).</li> <li>• Do not butt or hammer the shaft end.</li> </ul> |

|                                                                                   |                                                                                                                                                                  |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>NOTE</b>                                                                                                                                                      |
|                                                                                   | <p>Components with a keyway to be mounted belatedly on the shaft must be balanced using a half key. Motor shafts with a keyway are balanced with a half key.</p> |

### 4.4.2 Use of belt pulleys/toothed belt pulleys

|                                                                                     |                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>NOTE ON EXPLOSION PROTECTION</b>                                                                                                                                                                                                                                                             |
|                                                                                     | <ul style="list-style-type: none"> <li>• If using belt pulleys / toothed belt pulleys: <ul style="list-style-type: none"> <li>– Only use belts that do not build up an electrostatic charge.</li> <li>– Do not exceed the maximum permitted overhung load (see page 50).</li> </ul> </li> </ul> |

### 4.4.3 Installation in wet areas or in the open

- Try to arrange the motor and encoder connection so that the connector cables do not point upwards.
- Coat the threads of the cable glands and filler plugs with sealing compound and tighten them properly. Then coat them again.
- Clean the sealing surfaces of the connector (motor and/or encoder connection) before reassembly.
- Replace any brittle seals.
- If necessary, restore the anticorrosive paint coat.
- Check the validity of the degree of protection according to the nameplate.
- If necessary, attach covers (protection canopy).



#### 4.5 Installation tolerances

| Shaft end                                                                                                                                  | Flanges                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Diameter tolerance in accordance with DIN 748 <ul style="list-style-type: none"> <li>• ISO k6</li> <li>• Center bore to DIN 332</li> </ul> | Centering shoulder tolerance to DIN 42948 <ul style="list-style-type: none"> <li>• ISO j6</li> </ul> |

#### 4.6 Special conditions for plug connections

|  |                                                                                                                                                           |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>NOTE ON EXPLOSION PROTECTION</b>                                                                                                                       |
|  | Protect the connectors from falling objects by fitting a suitable cover. The cover must be able to absorb a blow energy of 7 J (according to EN 60079-0). |



## 5 Electrical Installation

### 5.1 General information

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>HAZARD!</b></p> <p>Risk of injury due to electric shock.</p> <p><b>Severe or fatal injuries!</b></p> <ul style="list-style-type: none"> <li>• <b>Observe the safety notes in section 2 during installation.</b></li> <li>• Use switch contacts in utilization category AC-3 to EN 60947-4-1 to connect the servomotor and brake.</li> <li>• Observe the wiring instructions of the inverter manufacturer.</li> <li>• Observe the operating instructions for the inverter.</li> <li>• Do not pull the plug while it is energized.</li> </ul> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                                                                                                                                   |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>NOTE</b></p> <p>A bag containing the following information is attached to the servomotor:</p> <ul style="list-style-type: none"> <li>• Safety notes</li> <li>• Wiring diagram</li> </ul> <p><b>Observe those notes.</b></p> |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 5.2 Additional regulations for potentially explosive atmospheres

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>NOTE ON EXPLOSION PROTECTION</b></p> <p>In addition to the generally applicable installation regulations for low-voltage equipment (e.g. in Germany: DIN VDE 0100, DIN VDE 0105), it is also necessary to comply with the special regulations for setting up electrical machinery in potentially explosive atmospheres (operating safety regulations in Germany: EN 60079-14; EN 61241-14 and system-specific regulations).</p> |
|  | <p><b>NOTE ON EXPLOSION PROTECTION</b></p> <p>In a potentially explosive atmosphere, the plug connectors may not be unplugged under any circumstances while they carry voltage or while the motor is turning.</p> <p>Make sure that the correspondent servo inverter is safely disconnected from the supply system and the auxiliary power supply.</p>                                                                                |
|  | <p><b>NOTE ON EXPLOSION PROTECTION</b></p> <p>Observe the information regarding the thermal motor protection in section "Thermal motor protection" on page 34.</p>                                                                                                                                                                                                                                                                    |



### 5.3 Ambient conditions during operation

#### 5.3.1 Ambient temperature

The ambient temperature must correspond with the information on the nameplate and on the order confirmation. If the ambient temperature according to the nameplate is  $> 50\text{ }^{\circ}\text{C}$ , it is essential that the cables and cable glands used are suited for temperatures  $= 90\text{ }^{\circ}\text{C}$ .

#### 5.3.2 Hazardous radiation

Motors must not be exposed to hazardous radiation (such as ionizing radiation). Contact SEW-EURODRIVE if need be.

#### 5.3.3 Hazardous gases, vapors and dusts

If used according to their designated use, explosion-proof servomotors are incapable of igniting explosive gases, vapors or dusts. However, explosion-proof motors may not be subjected to gases, vapors or dusts that endanger operational safety, for example through

- Corrosion
  - Damage to the protective coating
  - Damage to the sealing material
- etc.

#### 5.3.4 General information on explosion protection

The explosion-proof CMP synchronous servomotors are intended for the following application zones.

| Motor category | Area of application                                                                                           |
|----------------|---------------------------------------------------------------------------------------------------------------|
| 3D             | Application in zone 22 and compliance with the design requirements for equipment group II, category 3D.       |
| 3GD            | Application in zone 2 or 22 and compliance with the design requirements for equipment group II, category 3GD. |

#### 5.3.5 Degree of protection IP65

SEW-EURODRIVE servomotors in category 3D and 3GD are supplied with at least enclosure IP65 (forced cooling fan not permitted for ATEX).

#### 5.3.6 Temperature class / surface temperature

The servomotors are designed for temperature class T3. The maximum surface temperature is  $150\text{ }^{\circ}\text{C}$ .



### 5.3.7 Protection against impermissibly high surface temperatures

Explosion-proof servomotors in categories 3D and 3GD ensure safe operation under normal operating conditions. The servomotor must be switched off securely in the case of overload to avoid the risk of impermissibly high surface temperatures.



#### NOTE ON EXPLOSION PROTECTION

The CMP servomotors come equipped with KTY temperature sensors. The temperature monitoring for the motors must be performed using the KTY temperature sensor and the provided temperature model. Due to the high dynamics, this is the only way to provide for an effective thermal protection.

This is why, during startup and after any changes to the inverter parameters, you must check that the temperature model of the servo inverter is activated. This is the only way for the drive to be switched off if an overtemperature is detected.

The motor may only be restarted after the fault that tripped the temperature sensor has been eliminated.



#### 5.4 Connecting the CMP servomotor

##### 5.4.1 Procedure

- Connect the servomotor according to the enclosed wiring diagram.
- Check whether the cable cross sections comply with:
  - The rated motor current
  - The applicable installation instructions
  - The requirements of the place of installation
- Screw on the connections and PE conductors.
- Check the winding connections in the terminal box and tighten them, if necessary.

##### 5.4.2 Wiring diagrams



#### NOTE

The servomotor must only ever be connected as shown in the following wiring diagram, which is also included with the servomotor.

The following applies to all wiring diagrams:

- View on wiring side
- Colors according to SEW-EURODRIVE cable:

| Color code | Color       |
|------------|-------------|
| BK         | Black       |
| BN         | Brown       |
| BU         | Blue        |
| GN         | Green       |
| GY         | Gray        |
| OG         | Orange      |
| PK         | Pink        |
| RD         | Red         |
| VT         | Violet      |
| WH         | White       |
| YE         | Yellow      |
| GY / PK    | Gray/pink   |
| RD / BU    | Red/blue    |
| BK / WH    | Black/white |
| RD / WH    | Red/white   |

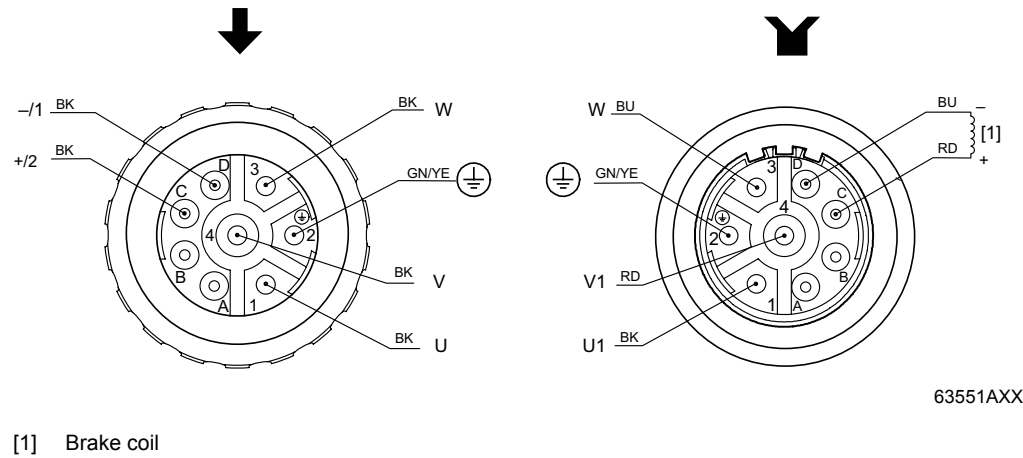


**Symbols used**

|                                                                                   |                                                                |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------|
|  | Plug connector upper part<br>(to be connected by the customer) |
|  | Plug connector lower part<br>(connected in factory)            |

**Power plug connector**

Wiring diagram  
with/without brake



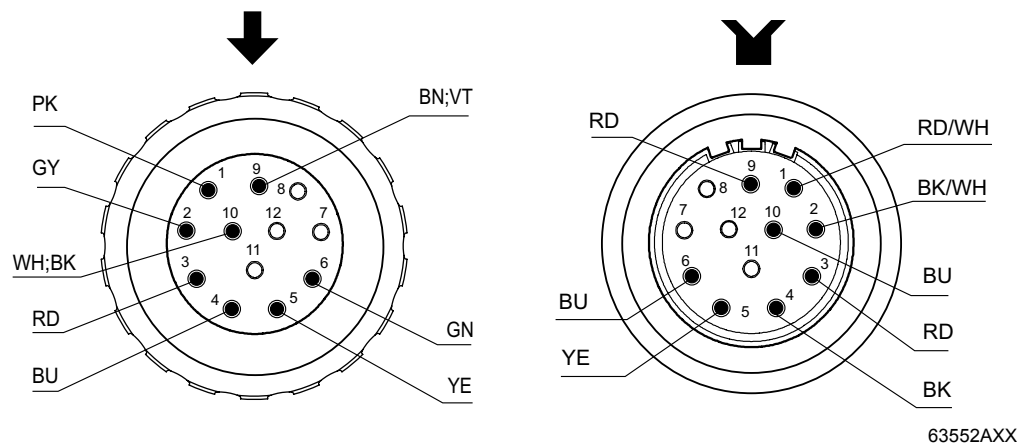


## Electrical Installation

### Connecting the CMP servomotor

#### ***RH1M resolver signal plug connector***

*Wiring diagram*



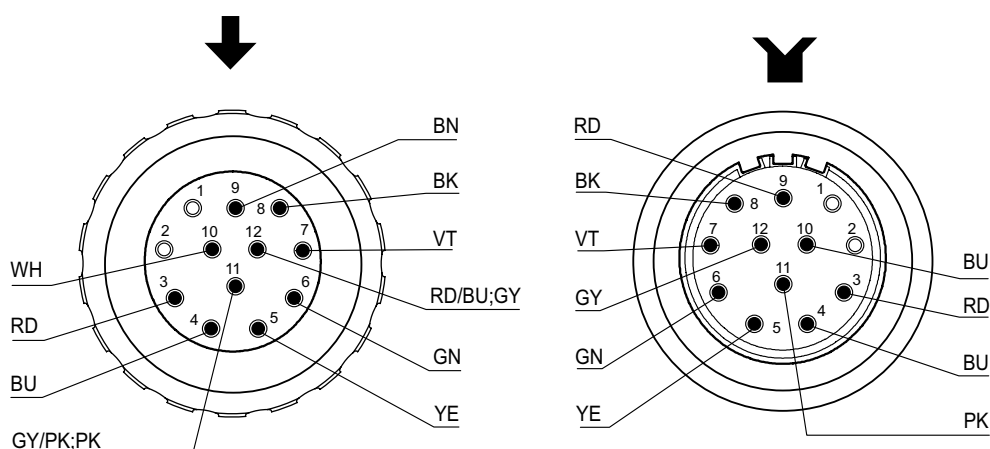
*Contact assignment of plug connector lower part*

| Contact | Color code | Connection       |
|---------|------------|------------------|
| 1       | RD / WH    | R1 (reference +) |
| 2       | BK / WH    | R2 (reference –) |
| 3       | RD         | S1 (cosine +)    |
| 4       | BK         | S3 (cosine –)    |
| 5       | YE         | S2 (sine +)      |
| 6       | BU         | S4 (sine –)      |
| 7       | –          | –                |
| 8       | –          | –                |
| 9       | RD         | KTY +            |
| 10      | BU         | KTY –            |
| 11      | –          | –                |
| 12      | –          | –                |



### ES1H, AS1H, AK0H, EK0H encoder signal plug connector

Wiring diagram



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Contact assignment of plug connector lower part

| Contact | Color code | Connection              |
|---------|------------|-------------------------|
| 1       | —          | —                       |
| 2       | —          | —                       |
| 3       | RD         | S1 (cosine +)           |
| 4       | BU         | S3 (cosine –)           |
| 5       | YE         | S2 (sine +)             |
| 6       | GN         | S4 (sine –)             |
| 7       | VT         | D –                     |
| 8       | BK         | D+                      |
| 9       | RD         | KTY +                   |
| 10      | BU         | KTY –                   |
| 11      | PK         | Voltage reference (GND) |
| 12      | GY         | Supply voltage Vs       |

### 5.4.3 Signal plug connector

The following notes must be observed when connecting the encoder/resolver:

- Use only shielded cables with twisted pair cores.
- Connect the shield to the PE potential on both ends over a large surface area.
- Route the signal cables separately from the power cables (min. distance 200 mm).



### NOTE ON EXPLOSION PROTECTION

Do not unplug the signal plug connector while it is energized!

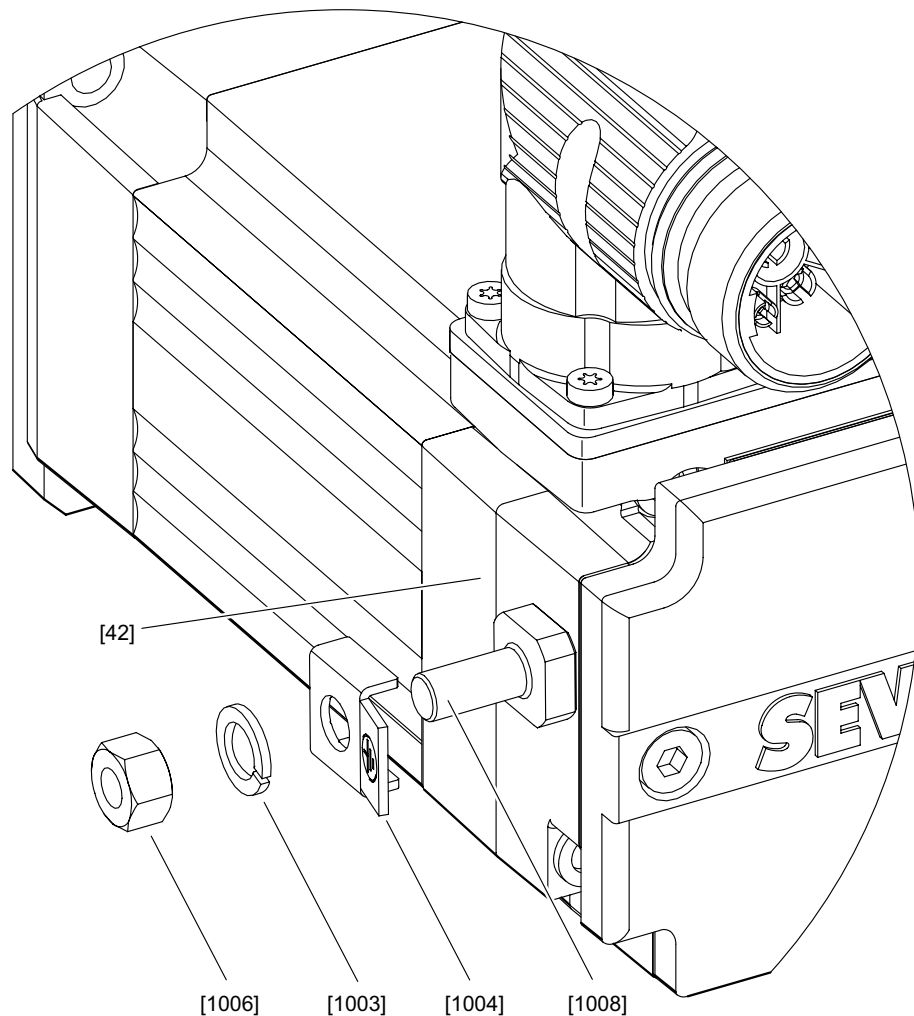


#### 5.5 Brake

The BP brake is released electrically. The brake is applied mechanically when the voltage is switched off.

#### 5.6 Equipotential bonding

In accordance with EN 60079-14 and EN 61241-0, it might be necessary to establish a connection to an equipotential bonding system (see following figure).



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|        |                  |        |                      |
|--------|------------------|--------|----------------------|
| [42]   | B-side endshield | [1006] | Hex nut              |
| [1003] | Lock washer      | [1007] | Serrated lock washer |
| [1004] | Terminal clip    | [1008] | Ground stud          |



### 5.7 Connector installation

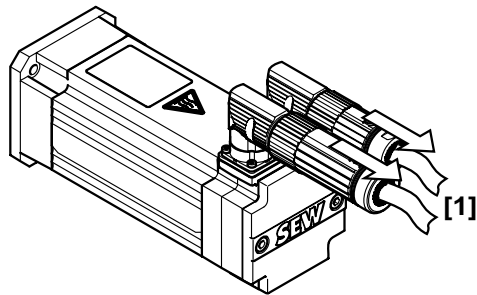
The cable entry of the power and signal cable is installed using an adjustable right-angle connector. Once the mating connector has been plugged in, the right-angle connector can be adjusted as required without using additional tools. A torque of approximately 10 Nm is required to adjust the connector.

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>STOP!</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                   | <p>If the connector is tightened when it is installed in the wrong position, the insulator could slip, causing irreparable damage.</p> <p><b>Potential damage to property!</b></p> <p>Note the following when plugging in the power and signal connectors:</p> <ul style="list-style-type: none"><li>• Check that the connector is installed in the correct position.</li><li>• Check that the detent on the connector is positioned correctly.</li><li>• Make sure that the connector lock can be turned without having to apply too much force.</li></ul> |

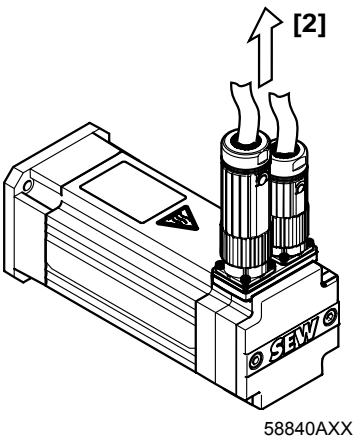
#### 5.7.1 Connector positions

An [adjustable] position has been defined for right-angle, rotatable connectors. This is the standard connector position. It corresponds to connector position "3".

A "radial" position has been defined for the straight connector housing (radial output). Radial connectors [2] are optional.



[1] Connector position "adjustable"



[2] Connector position "radial"

|                                                                                     |                                                        |
|-------------------------------------------------------------------------------------|--------------------------------------------------------|
|  | <b>NOTE</b>                                            |
|                                                                                     | Comply with the permitted bending radii of the cables. |



The right-angle connectors can be rotated to achieve the required position.



#### NOTE

The connector should only be rotated to install and connect the servomotor. Do expose the connector to permanent motion once it has been installed.

#### *Different positions of the adjustable connectors*



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## 5.8 Wiring information

### 5.8.1 Protecting the brake control system against interference

To protect the brake control system against interference, do not route unshielded brake cables together with switched-mode power cables.

Switched-mode power cables include in particular:

- Output cables from inverters, converters, soft start units and brake units
- Supply cables to braking resistors and similar.

### 5.8.2 Thermal motor protection

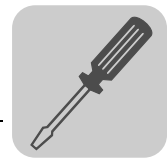


#### STOP!

Install the connecting lead of the KTY separately from other power cables, maintaining a distance of at least 200 mm. The cables can only be routed together if either the KTY cable or the power cable is shielded.

### 5.8.3 Special aspects for operation with a servo inverter

When servomotors are powered from inverters, the wiring instructions issued by the inverter manufacturer must be followed. Observe section "Operation" on page 37 And the operating instructions for the inverter.



## 5.9 Connecting the servomotors and the encoder system via SM/SB plug connectors

The CMP synchronous servomotors are supplied with an SM/SB plug connector system. In the basic design, SEW-EURODRIVE delivers CMP synchronous servomotors with a flange socket on the motor end and without mating connector. The encoder system is connected using a separate 12-pin round plug connector.

The mating connectors can be ordered separately.

|                                                                                   |                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>STOP!</b>                                                                                                                                                                                    |
|                                                                                   | Route the signal cables separately from the power cables with a minimum distance of 200 mm. The cables can only be routed together if either the feedback cable or the power cable is shielded. |

### 5.9.1 Plug connector on the cable end

#### Power cable

| Plug connector system | Cable type                      | Type <sup>1)</sup> | Cable cross section                             | Part number |
|-----------------------|---------------------------------|--------------------|-------------------------------------------------|-------------|
| SM11                  | Motor cable                     | Fixed              | 4 x 1.5 mm <sup>2</sup>                         | 0590 4544   |
| SM12                  |                                 |                    | 4 x 2.5 mm <sup>2</sup>                         | 0590 4552   |
| SM14                  |                                 |                    | 4 x 4 mm <sup>2</sup>                           | 0590 4560   |
| SM11                  | Motor cable                     | Flex               | 4 x 1.5 mm <sup>2</sup>                         | 0590 6245   |
| SM12                  |                                 |                    | 4 x 2.5 mm <sup>2</sup>                         | 0590 6253   |
| SM14                  |                                 |                    | 4 x 4 mm <sup>2</sup>                           | 0590 4803   |
| SB11                  | Brake motor cable <sup>2)</sup> | Fixed              | 4 x 1.5 mm <sup>2</sup> + 2 x 1 mm <sup>2</sup> | 1332 4853   |
| SB12                  |                                 |                    | 4 x 2.5 mm <sup>2</sup> + 2 x 1 mm <sup>2</sup> | 1333 2139   |
| SB14                  |                                 |                    | 4 x 4 mm <sup>2</sup> + 2 x 1 mm <sup>2</sup>   | 1333 2147   |
| SB11                  | Brake motor cable <sup>2)</sup> | Flex               | 4 x 1.5 mm <sup>2</sup> + 2 x 1 mm <sup>2</sup> | 1333 1221   |
| SB12                  |                                 |                    | 4 x 2.5 mm <sup>2</sup> + 2 x 1 mm <sup>2</sup> | 1333 2155   |
| SB14                  |                                 |                    | 4 x 4 mm <sup>2</sup> + 2 x 1 mm <sup>2</sup>   | 1333 2163   |

1) Fixed: fixed routing; flex: Cable carrier installation

2) 3-core cable, only 2 cores are used



## Electrical Installation

Connecting the servomotors and the encoder system via SM/SB plug con-

### 5.9.2 Feedback cable

#### Feedback cable

| Cable type       | Type <sup>1)</sup> | Inverter type        | Part number |
|------------------|--------------------|----------------------|-------------|
| Resolver cable   | Fixed              | MOVIDRIVE®           | 0199 4875   |
|                  | Flex               | MOVIDRIVE®           | 0199 3194   |
|                  | Fixed              | MOVIAXIS®            | 1332 7429   |
|                  | Flex               | MOVIAXIS®            | 1332 7437   |
|                  |                    |                      |             |
| HIPERFACE® cable | Fixed              | MOVIDRIVE®/MOVIAXIS® | 1332 4535   |
|                  | Flex               | MOVIDRIVE®/MOVIAXIS® | 1332 4551   |

1) Fixed: fixed routing; flex: Cable carrier installation

### 5.9.3 Mating connector combinations

| Cable type                 |                                | Cable cross section                             | Part number<br>Power connector |
|----------------------------|--------------------------------|-------------------------------------------------|--------------------------------|
| Fixed installation         | Motor cable                    | 4 x 1.5 mm <sup>2</sup>                         | 0198 6740                      |
|                            |                                | 4 x 2.5 mm <sup>2</sup>                         | 0198 6740                      |
|                            |                                | 4 x 4 mm <sup>2</sup>                           | 0199 1639                      |
|                            | Brakemotor cable <sup>1)</sup> | 4 x 1.5 mm <sup>2</sup> + 2 x 1 mm <sup>2</sup> | 0198 6740                      |
|                            |                                | 4 x 2.5 mm <sup>2</sup> + 2 x 1 mm <sup>2</sup> | 0198 6740                      |
|                            |                                | 4 x 4 mm <sup>2</sup> + 2 x 1 mm <sup>2</sup>   | 0199 1639                      |
|                            |                                |                                                 |                                |
| Cable carrier installation | Motor cable                    | 4 x 1.5 mm <sup>2</sup>                         | 0198 6740                      |
|                            |                                | 4 x 2.5 mm <sup>2</sup>                         | 0198 9197                      |
|                            |                                | 4 x 4 mm <sup>2</sup>                           | 0199 1639                      |
|                            | Brakemotor cable <sup>1)</sup> | 4 x 1.5 mm <sup>2</sup> + 2 x 1 mm <sup>2</sup> | 0198 9197                      |
|                            |                                | 4 x 2.5 mm <sup>2</sup> + 2 x 1 mm <sup>2</sup> | 0198 9197                      |
|                            |                                | 4 x 4 mm <sup>2</sup> + 2 x 1 mm <sup>2</sup>   | 0199 1639                      |

1) 3-core cable, only 2 cores are used

| Cable type                           |                | Cable cross section          | Part number<br>Signal connector |
|--------------------------------------|----------------|------------------------------|---------------------------------|
| Fixed and cable carrier installation | Resolver cable | 5 x 2 x 0.25 mm <sup>2</sup> | 0198 6732                       |
|                                      | Encoder cable  | 6 x 2 x 0.25 mm <sup>2</sup> |                                 |

The complete set of the mating connectors always includes the following parts:

- Feedback/power connector
- Insulation inserts,
- Socket contacts.



#### 5.9.4 Prefabricated cables

Prefabricated cables are available from SEW-EURODRIVE to connect the SM/SB plug connector system. For information on the prefabricated cables, refer to the "DR, CMP Motors" catalog.

For information on the mating connectors with matching crimp contacts 1.5 mm<sup>2</sup>, 2.5 mm<sup>2</sup> and 4 mm<sup>2</sup>, refer to the "DR, CMP motors" catalog.

#### **Assembling the cables**

Observe the following notes if you want to assemble the cables yourself:

- Section "Power plug connector assembly" on page 69 illustrates the assembly of the SM/SB power connectors.
- Section "HIPERFACE® resolver signal plug connector assembly" on page 72 illustrates the assembly of the signal connectors.
- The socket contacts for the motor connection are designed as crimp contacts. Only use suitable tools for crimping.
- Strip the insulation of the leads according to section "Power plug connector assembly" on page 69.
- Use suitable removal tools to remove incorrectly installed socket contacts.
- Install the insulator in the signal connectors on the motor end at 'zero' degree (center position). Observe this coding on the cable end.
- Cable relief according to EN 61984 and EN 60529 is influenced by the tightening torque of the screw. The tightening torque must be adjusted to the cable.



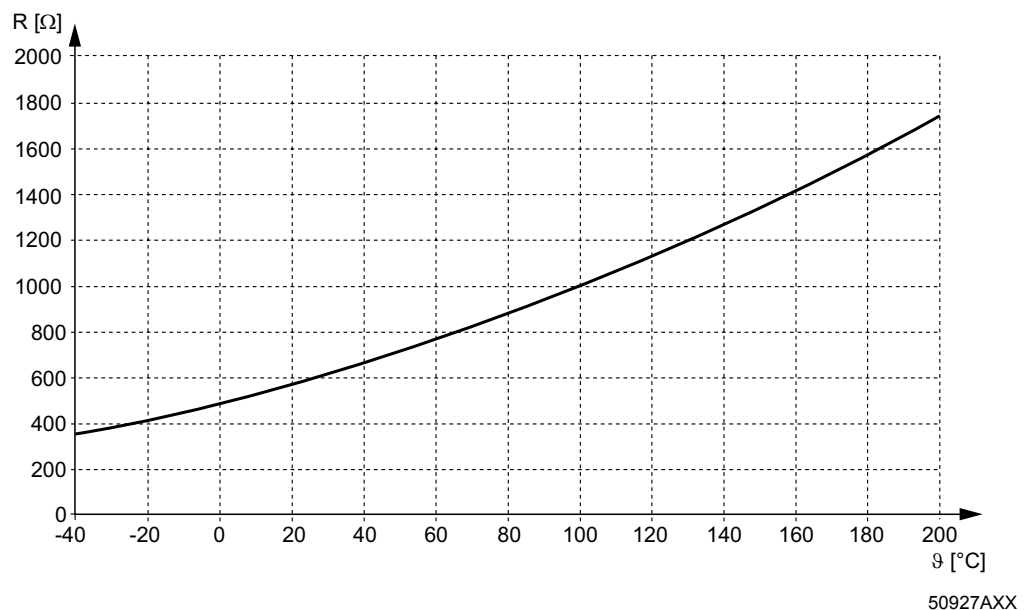
#### 5.10 Thermal motor protection

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>NOTE ON EXPLOSION PROTECTION</b>                                                                                                                                                                                                                                                                                                                                                                                                                            |
|  | <p>Due to the low thermal time constants of the winding, a thermal motor protection is only achieved if the motor current is limited on the basis of the following criteria:</p> <ul style="list-style-type: none"> <li>• Measured values of the KTY temperature sensor</li> <li>• In addition, a motor model for thermal protection must be activated as it is the case with SEW inverters. This motor model must match the respective servomotor.</li> </ul> |

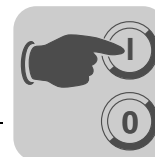
#### KTY temperature sensor

|  |                                                                                                                                                                                                                                                                                                                                                                                               |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>STOP!</b>                                                                                                                                                                                                                                                                                                                                                                                  |
|  | <p><b>Incorrect connection may cause damage to the temperature sensor and the motor winding!</b></p> <p>Avoid currents &gt; 4 mA in the circuit of the KTY since high self-heating of the temperature sensor can damage its insulation and the motor winding.</p> <p>It is essential to observe the correct connection of the KTY to ensure correct evaluation of the temperature sensor.</p> |

The following figure shows the resistance of the KTY sensor subject to the motor temperature. The characteristic curve shows the resistance curve with a measuring current of 2 mA and correct pole connection.

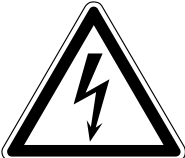


For detailed information on connecting the KTY, refer to the contact assignments of the resolver/encoder cable. Observe the correct polarity.



## 6 Startup

### 6.1 Prerequisites for startup

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>HAZARD!</b></p> <p>Risk of injury due to electric shock.</p> <p><b>Severe or fatal injuries!</b></p> <ul style="list-style-type: none"> <li>• <b>Observe the safety notes in section 2 during startup.</b></li> <li>• Use switch contacts in utilization category AC-3 to EN 60947-4-1 to connect the servomotor and brake.</li> <li>• Observe the wiring instructions of the inverter manufacturer.</li> <li>• Observe the operating instructions for the servo inverter.</li> </ul> |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                   |                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>NOTE</b></p> <p>The rated speed of the servomotor in a gearmotor can be higher than the permitted, input speed of the gear unit. Set the maximum speed on the servo inverter. For information on the procedure, refer to the documentation of the inverter.</p> |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### Before startup

|                                                                                     |                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>NOTE ON EXPLOSION PROTECTION</b></p> <p>Before starting up the unit for the first time, make sure that:</p> <ul style="list-style-type: none"> <li>• The plug-in connections have been established correctly.</li> <li>• The plug connectors are protected against inadvertent interruption.</li> </ul> |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- The drive must be undamaged and not blocked.
- The measures stipulated in section "Preliminary work" must be performed after extended storage page 17
- All connections must be established correctly.
- The direction of rotation of the servomotor/gearmotor must match.
- All protective covers must be fitted correctly.
- All motor protection devices must be active.
- There must not be any other sources of danger.
- No heat-sensitive or insulating materials are allowed to cover the servomotor surface.



## Startup

### Parameter setting on the servo inverter

#### *During startup*

- The servomotor must run correctly (no overload, no unwanted speed fluctuations, no loud noises, etc.).
- In case of problems, refer to section 7, "Malfunctions" on page 39.

## 6.2 Parameter setting on the servo inverter

### 6.2.1 General information

|  |                                                                          |
|--|--------------------------------------------------------------------------|
|  | <b>NOTE ON EXPLOSION PROTECTION</b>                                      |
|  | Install the servo inverter outside the potentially explosive atmosphere. |

Observe the relevant operating instructions for servo inverter startup.

|  |                                                                                                                                                                                                                                                                                                                                                                                     |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>NOTE ON EXPLOSION PROTECTION</b>                                                                                                                                                                                                                                                                                                                                                 |
|  | <p>Use the guided startup function of MOVITOOLS® MotionStudio or the MOVITOOLS® software. It is essential to note that the maximum current limit must be checked/reset after each guided startup.</p> <p>Activate the thermal motor protection during startup. Observe the information regarding the thermal motor protection in section "Thermal motor protection" on page 34.</p> |

### 6.2.2 Setting the maximum frequency or the maximum speed

The inverter parameters which limit the maximum motor speed must be set according to the assignment tables for motor/inverter combinations. For gear unit mounting: observe the maximum speed of the respective gear unit.



## 7 Operation

### 7.1 Inverter operation in categories 3D and 3GD

#### 7.1.1 Using servomotors in category II3GD

|                                                                                   |                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>NOTE ON EXPLOSION PROTECTION</b>                                                                                                                                                     |
|                                                                                   | <p>The following applies:</p> <ul style="list-style-type: none"> <li>• Use as category II3D unit in zone 22</li> <li>• Use as category II3GD unit in both zone 2 and zone 22</li> </ul> |

#### 7.1.2 Conditions for safe operation

##### General information

|                                                                                   |                                                                          |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|
|  | <b>NOTE ON EXPLOSION PROTECTION</b>                                      |
|                                                                                   | Install the servo inverter outside the potentially explosive atmosphere. |

##### Servomotor/inverter combination

- The listed servomotor/inverter combinations are recommended for category II3GD servomotors. Servo inverters that have similar values with respect to output current and output voltage (EN 60079-15) can also be used.
- The listed servomotor/inverter combinations are recommended for category II3D servomotors. If you want to operate category II3D servomotors on other servo inverters, the maximum speeds/frequencies, the thermal motor protection as well as the thermal torque limiting characteristic curves must also be observed. In addition, we strongly recommend you use a frequency inverter matching the respective power rating.

##### Temperature class and surface temperature

- The maximum surface temperature of II3D servomotors is 150 °C.
- II3GD servomotors are in temperature class T3 and have a maximum surface temperature of 150 °C.

##### Protection against excessive temperature

See chapter 'Protection against impermissibly high surface temperatures' on page 23.



## Operation

Inverter operation in categories 3D and 3GD

### **Overvoltage at the motor connections**

The overvoltage at the motor connections must be limited to  $< 1700 \text{ V}$ . To do so, limit the input voltage at the servo inverter to  $500 \text{ V}$ .

If a reliable calculation of the voltage at the motor connections is not possible, the voltage peaks have to be measured with suitable equipment after startup, using the rated load of the drive, if possible.

### **Unplugging the plug connectors**



#### **NOTE ON EXPLOSION PROTECTION**

In a potentially explosive atmosphere, the plug connectors may not be unplugged under any circumstances while they carry voltage or while the motor is turning.

Make sure that the corresponding servo inverter is safely disconnected from the supply system and the auxiliary power supply.



## 8 Malfunctions

### 8.1 Servomotor malfunctions

| Malfunction                                                                             | Possible cause                                                                       | Remedy                                                                                                                                          |
|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Servomotor does not start                                                               | Supply cable interrupted                                                             | Check connections, correct if necessary                                                                                                         |
|                                                                                         | Fuse has blown                                                                       | Replace fuse                                                                                                                                    |
|                                                                                         | Motor protection has triggered                                                       | Check motor protection for correct setting, correct fault if necessary                                                                          |
|                                                                                         | Servo inverter faulty, overloaded, incorrectly wired or incorrectly set              | Check servo inverter, check wiring                                                                                                              |
| Incorrect direction of rotation                                                         | Servomotor connected incorrectly                                                     | Check servo inverter, check setpoints                                                                                                           |
| Servomotor hums and has high current consumption                                        | Drive is blocked                                                                     | Check drive                                                                                                                                     |
|                                                                                         | Brake does not release                                                               | See section "Brake malfunctions" (σελιδη page 40).                                                                                              |
|                                                                                         | Encoder cable malfunction                                                            | Check encoder cable                                                                                                                             |
|                                                                                         | Servo inverter setting incorrect                                                     | Check servo inverter                                                                                                                            |
| Servomotor heats up excessively (measure temperature, significantly higher than 110 °C) | Overload                                                                             | Measure power, use larger servomotor or reduce load if necessary, check travel profile                                                          |
|                                                                                         | Ambient temperature is too high                                                      | Comply with permitted temperature range                                                                                                         |
|                                                                                         | Insufficient cooling                                                                 | Correct cooling air supply or clear cooling air passages                                                                                        |
|                                                                                         | Rated operating mode (S1 to S10, EN 60034) exceeded, e.g. caused by excessive torque | Adjust the rated operating mode of the servomotor to the operating conditions; consult a professional to determine the correct drive if need be |
|                                                                                         | Servo inverter not optimized                                                         | Check servo inverter                                                                                                                            |
| Running noise on servomotor                                                             | Bearing damage                                                                       | <ul style="list-style-type: none"> <li>• Contact SEW-EURODRIVE customer service</li> <li>• Replace the servomotor</li> </ul>                    |
|                                                                                         | Vibration of rotating parts                                                          | Rectify cause, possible imbalance                                                                                                               |

### 8.2 Malfunctions when operated with a servo inverter

|  |                                                                                                                                                                                                                                                                                     |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>NOTE</b>                                                                                                                                                                                                                                                                         |
|  | The symptoms described in section "Servomotor malfunctions " may also occur when the motor is operated with a servo inverter. Please refer to the inverter operating instructions for the meaning of the problems that occur and to find information about rectifying the problems. |

**Please have the following information available if you require assistance from the SEW-EURODRIVE Service:**

- Complete nameplate data.
- Type and extent of the problem.
- Time the problem occurred and any accompanying circumstances.
- Assumed cause



### 8.3 Brake malfunctions

| Malfunction                    | Possible cause                                                         | Remedy                                                                                                       |
|--------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Brake does not release         | Incorrect voltage on brake control unit                                | Apply correct voltage                                                                                        |
|                                | Brake control unit failed                                              | Install a new brake control system, check internal resistance and insulation of brake coil, check switchgear |
|                                | Brake connected incorrectly                                            | Check brake connection                                                                                       |
|                                | Max. permitted working air gap exceeded because brake lining worn down | <ul style="list-style-type: none"> <li>Consult SEW-EURODRIVE</li> <li>Replacing the motor</li> </ul>         |
|                                | Voltage drop along connecting harness > 10%                            | Correct connection voltage; check cable cross section                                                        |
|                                | Brake coil has interturn short circuit or a short circuit to frame     | Consult SEW-EURODRIVE                                                                                        |
| Servomotor does not brake      | Brake lining worn                                                      | <ul style="list-style-type: none"> <li>Consult SEW-EURODRIVE</li> <li>Replacing the motor</li> </ul>         |
|                                | Incorrect braking torque.                                              | <ul style="list-style-type: none"> <li>Consult SEW-EURODRIVE</li> <li>Replacing the motor</li> </ul>         |
|                                | Manual brake release device not set correctly                          | Set the setting nuts correctly                                                                               |
| Brake is applied with time lag | Brake is switched on AC voltage side                                   | Switch both, the DC and AC voltage sides; observe wiring diagram                                             |
| Noises in vicinity of brake    | Pulsating torques due to incorrectly set frequency inverter            | Check/correct setting of frequency inverter according to operating instructions                              |



## 9 Inspection/Maintenance

Only SEW service staff, repair workshops or plants that have the necessary expertise may repair or modify the servomotor.

Before re-startup of the servomotor, make sure that all regulations are complied with and document this with a label on the servomotor or a written test report.

|  | NOTE ON EXPLOSION PROTECTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Maintenance and repair work must always be performed by SEW-EURODRIVE or repair workshops for electrical drives.</li> <li>• Use only original spare parts from the relevant and valid spare parts lists; otherwise, the explosion-proof approval for the servomotor will become void.</li> <li>• The routine test must be repeated whenever motor parts relating to explosion protection are replaced.</li> <li>• Servomotors can become very hot during operation – danger of burns!</li> <li>• Isolate the servomotor and brake from the power supply before starting work, safeguarding them against unintentional re-start!</li> <li>• Drive must be shut down safely for the duration of the maintenance work, since rotation will energize the motor terminals.</li> <li>• Ensure that the servomotor is assembled correctly and all openings have been plugged after service and maintenance work.</li> <li>• Clean servomotors in explosion-proof areas regularly. Prevent dust deposits &gt; 5 mm.</li> <li>• Explosion protection is largely dependent on the IP enclosure. Therefore, always check that the seals are fitted correctly and in perfect condition when performing any work on the machine.</li> <li>• Apply grease with a grease depot (Klüber Patemo GHY133N) to the lip of the oil seal before assembly.</li> <li>• Always perform safety and functional tests following all maintenance and repair work (thermal protection, brake).</li> <li>• Explosion protection can only be ensured if servomotors and brakes are serviced and maintained correctly.</li> </ul> |



## Inspection/Maintenance

### Brake malfunctions

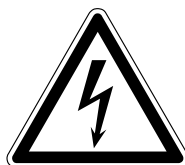


#### **HAZARD!**

The surface temperature of the servomotor can exceed 100 °C during operation.

##### **Danger of burns!**

- Never touch the CMP servomotor during operation or in the cool down phase once the it has been switched off.
- Let the servomotor cool down before you start your work.
- Wear protective gloves.



#### **HAZARD!**

The servomotor has live parts during and after operation.

##### **Severe or fatal injuries from electric shock!**

- Do not perform any maintenance work while the machine is running!
- De-energize all power, brake and signal cables before unplugging the power or signal plug connector.
- Safeguard against accidental startup.



#### **STOP!**

Only use original spare parts, otherwise the servomotor can be damaged.

Potential damage to property!

- Only use genuine spare parts in accordance with the valid parts list.



#### **STOP!**

The motor must be disassembled when replacing the brake which cannot be adjusted.

Potential damage to property!

- Only service engineers from SEW-EURODRIVE can perform maintenance on the BP brake because the encoder or resolver has to be reset each time the system is disassembled.



## 9.1 Inspection intervals

The amount of wear depends on many factors and may be high. Inspection intervals must be determined and documented by the operator during startup.

|  |                                                                        |
|--|------------------------------------------------------------------------|
|  | <b>NOTE</b>                                                            |
|  | Take the manufacturer's data into account in the maintenance schedule. |

### 9.1.1 Cleaning

Excessive dirt, dust or shavings can have a negative impact on the function of servomotors; in extreme cases these factors can cause the servomotor to break down.

Therefore, you must clean the servomotors at regular intervals (after one year at the latest) to ensure a sufficiently large area for heat emission.

Insufficient heat emission can have unwanted consequences. The bearing service life is reduced through operation at impermissibly high temperatures (bearing grease degrades).

### 9.1.2 Connection cable

Check the connection cable for damage at regular intervals and replace it, if need be.

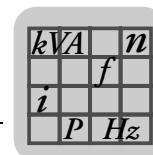
|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <div data-bbox="416 1066 1442 1126">  <b>HAZARD!</b> </div> <p data-bbox="416 1131 1091 1162">The servomotor has live parts during and after operation.</p> <p data-bbox="416 1171 967 1202"><b>Severe or fatal injuries from electric shock!</b></p> <ul data-bbox="416 1211 1442 1429" style="list-style-type: none"> <li>• De-energize all power, brake and signal cables before unplugging the power or signal plug connector.</li> <li>• Safeguard against accidental startup.</li> <li>• Do not perform temporary repairs on the connection cables. When the cable jacket is defective, no matter how small the fault, shut down the system immediately and replace the cable.</li> </ul> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



#### 9.1.3 Maintenance intervals

| Unit / unit part           | Time interval                                                                                        | What do I do?                                                                                                                                                                                      |
|----------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Servomotor</b>          | <ul style="list-style-type: none"> <li>• <b>Every 10,000 operating hours<sup>1)</sup></b></li> </ul> | Inspect the servomotor: <ul style="list-style-type: none"> <li>• Check ball bearings and replace if necessary</li> <li>• Replace the oil seal</li> <li>• Clean the cooling air passages</li> </ul> |
| <b>Drive</b>               | <ul style="list-style-type: none"> <li>• Varies<br/>(depending on external factors)</li> </ul>       | <ul style="list-style-type: none"> <li>• Touch up or renew the surface/anti-corrosion coating</li> </ul>                                                                                           |
| <b>Servomotor surfaces</b> | <ul style="list-style-type: none"> <li>• Varies<br/>(depending on external factors)</li> </ul>       | <ul style="list-style-type: none"> <li>• Clean surfaces</li> </ul>                                                                                                                                 |

1) The periods of wear are affected by many factors and may be shorter than the recommendation above.



## 10 Technical Data

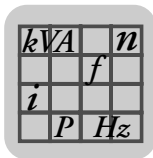
### 10.1 Motor data of explosion-proof CMP synchronous servomotors

| $n_N$<br>[rpm] | Servomotor | $M_0$<br>[Nm] | $M_{max}$<br>[Nm] | $I_0$<br>[A] | $I_{max}$<br>[A] | $L_1$<br>[mH] | $R_1$<br>Ω | $U_{p0}$ cold<br>[V] | $n_{max}$<br>[rpm] |
|----------------|------------|---------------|-------------------|--------------|------------------|---------------|------------|----------------------|--------------------|
| 3000           | CMP40S     | 0.5           | 1.3               | 1.18         | 3.5              | 23.00         | 11.94      | 27.5                 | 4500               |
|                | CMP40M     | 0.8           | 2.6               | 0.95         | 2.9              | 45.85         | 19.93      | 56.3                 |                    |
|                | CMP50S     | 1.3           | 3.5               | 0.96         | 2.9              | 71.23         | 22.49      | 86.3                 |                    |
|                | CMP50M     | 2.3           | 6.3               | 1.61         | 4.8              | 38.34         | 9.96       | 90.3                 |                    |
|                | CMP50L     | 3.3           | 9.2               | 2.20         | 6.6              | 30.42         | 7.42       | 98.2                 |                    |
|                | CMP63S     | 2.8           | 7.2               | 2.06         | 6.2              | 36.37         | 6.80       | 90.1                 |                    |
|                | CMP63M     | 5.1           | 13.6              | 3.47         | 10.4             | 21.82         | 3.56       | 100.0                |                    |
|                | CMP63L     | 6.7           | 18.5              | 4.70         | 14.1             | 14.22         | 2.07       | 100.0                |                    |
| 4500           | CMP40S     | 0.5           | 1.3               | 1.18         | 3.5              | 23.00         | 11.94      | 27.5                 | 4500               |
|                | CMP40M     | 0.8           | 2.6               | 0.95         | 2.9              | 45.85         | 19.93      | 56.3                 |                    |
|                | CMP50S     | 1.3           | 3.5               | 1.32         | 4.0              | 37.19         | 11.61      | 86.3                 |                    |
|                | CMP50M     | 2.3           | 6.3               | 2.20         | 6.6              | 20.67         | 5.29       | 90.3                 |                    |
|                | CMP50L     | 3.3           | 9.2               | 3.15         | 9.5              | 14.58         | 3.57       | 98.2                 |                    |
|                | CMP63S     | 2.8           | 7.2               | 2.92         | 8.8              | 18.27         | 3.35       | 90.1                 |                    |
|                | CMP63M     | 5.1           | 13.6              | 5.21         | 15.6             | 9.79          | 1.48       | 100.0                |                    |
|                | CMP63L     | 6.7           | 18.5              | 6.55         | 19.7             | 7.21          | 1.07       | 100.0                |                    |

|               |                                                             |
|---------------|-------------------------------------------------------------|
| $n_N$         | Rated speed                                                 |
| $M_0$         | Standstill torque (thermal continuous torque at low speeds) |
| $I_0$         | Standstill current                                          |
| $M_{max}$     | Maximum limit torque of the servomotors                     |
| $I_{max}$     | Maximum permitted motor current                             |
| $L_1$         | Winding inductance                                          |
| $R_1$         | Winding ohmic resistance                                    |
| $U_{p0}$ cold | Internal voltage at 1000 rpm                                |
| $n_{max}$     | Permitted maximum speed                                     |

#### 10.1.1 Weight of the Servomotor

| Servomotor | Weight of the motor<br>[kg] | Weight of the brake motor<br>[kg] |
|------------|-----------------------------|-----------------------------------|
| CMP40S     | 1.3                         | 1.7                               |
| CMP40M     | 1.6                         | 2                                 |
| CMP50S     | 2.3                         | 2.9                               |
| CMP50M     | 3.3                         | 3.9                               |
| CMP50L     | 4.1                         | 4.7                               |
| CMP63S     | 4                           | 5                                 |
| CMP63M     | 5.7                         | 6.7                               |
| CMP63L     | 7.5                         | 8.5                               |



### 10.2 Inverter assignment to MOVIDRIVE®



#### NOTE

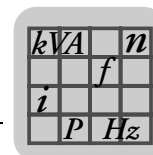
The inverter assignment for MOVIDRIVE® applies for a AC 400 V voltage supply.

#### 10.2.1 Rated speed $n_N = 3000$ rpm

| Servomotor | [Nm]      | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in servo operating modes (P700) |      |      |      |      |      |      |      |      |      |      |      |      |
|------------|-----------|-------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
|            |           | 0005                                                                          | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 | 0150 | 0220 |
| CMP40S     | $M_{max}$ | 1.3                                                                           | –    | –    | –    | 1.3  | –    | –    | –    | –    | –    | –    | –    | –    |
| CMP40M     | $M_{max}$ | 2.3                                                                           | –    | –    | –    | 2.3  | –    | –    | –    | –    | –    | –    | –    | –    |
| CMP50S     | $M_{max}$ | 3.5                                                                           | –    | –    | –    | 3.5  | –    | –    | –    | –    | –    | –    | –    | –    |
| CMP50M     | $M_{max}$ | 5.4                                                                           | 6.3  | –    | –    | 6.3  | –    | –    | –    | –    | –    | –    | –    | –    |
| CMP50L     | $M_{max}$ | 5.9                                                                           | 6.9  | 8.7  | 9.2  | 8.4  | 9.2  | –    | –    | –    | –    | –    | –    | –    |
| CMP63S     | $M_{max}$ | 5.1                                                                           | 6.0  | 7.2  | –    | 7.0  | 7.2  | –    | –    | –    | –    | –    | –    | –    |
| CMP63M     | $M_{max}$ | 6.0                                                                           | 7.1  | 8.9  | 11.0 | 8.6  | 11.3 | 13.5 | –    | –    | –    | –    | –    | –    |
| CMP63L     | $M_{max}$ | –                                                                             | 7.0  | 8.9  | 11.3 | 8.7  | 11.6 | 14.3 | 18.3 | –    | –    | –    | –    | –    |

#### 10.2.2 Rated speed $n_N = 4500$ rpm

| Servomotor | [Nm]      | MOVIDRIVE® MDX61B...-5_3 (AC 400/500 V units) in servo operating modes (P700) |      |      |      |      |      |      |      |      |      |      |      |      |
|------------|-----------|-------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
|            |           | 0005                                                                          | 0008 | 0011 | 0014 | 0015 | 0022 | 0030 | 0040 | 0055 | 0075 | 0110 | 0150 | 0220 |
| CMP40S     | $M_{max}$ | 1.3                                                                           | –    | –    | –    | 1.3  | –    | –    | –    | –    | –    | –    | –    | –    |
| CMP40M     | $M_{max}$ | 2.3                                                                           | –    | –    | –    | 2.3  | –    | –    | –    | –    | –    | –    | –    | –    |
| CMP50S     | $M_{max}$ | 3.5                                                                           | –    | –    | –    | 3.5  | –    | –    | –    | –    | –    | –    | –    | –    |
| CMP50M     | $M_{max}$ | 4.1                                                                           | 4.8  | 6.0  | 6.3  | 5.8  | 6.3  | –    | –    | –    | –    | –    | –    | –    |
| CMP50L     | $M_{max}$ | 4.2                                                                           | 5.0  | 6.3  | 7.9  | 6.1  | 8.2  | 9.2  | –    | –    | –    | –    | –    | –    |
| CMP63S     | $M_{max}$ | 3.8                                                                           | 4.5  | 5.5  | 6.7  | 5.4  | 6.9  | 7.2  | –    | –    | –    | –    | –    | –    |
| CMP63M     | $M_{max}$ | –                                                                             | –    | 6.2  | 7.8  | 6.0  | 8.0  | 9.8  | 12.6 | 13.5 | –    | –    | –    | –    |
| CMP63L     | $M_{max}$ | –                                                                             | –    | –    | 8.3  | 6.3  | 8.6  | 10.7 | 14.0 | 17.6 | 18.3 | –    | –    | –    |



### 10.3 Inverter assignment to MOVIAXIS®

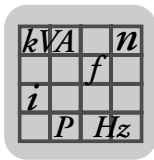
|  |                                                                              |
|--|------------------------------------------------------------------------------|
|  | <b>NOTE</b>                                                                  |
|  | The inverter assignment for MOVIAXIS® applies for a AC 400 V voltage supply. |

#### 10.3.1 Rated speed $n_N = 3000$ rpm

| Servomotor<br>Type | $I_N$<br>$I_{max}$ | [A]<br>[A] | MOVIAXIS® MXA<br>Size 1 |      |      |
|--------------------|--------------------|------------|-------------------------|------|------|
|                    |                    |            | 2                       | 4    | 8    |
|                    |                    |            | 5                       | 10   | 20   |
| CMP40S             | $I_{max}$          | % $I_N$    | 176                     | —    | —    |
|                    | $M_{max}$          | Nm         | 1.3                     | —    | —    |
| CMP40M             | $I_{max}$          | % $I_N$    | 141                     | —    | —    |
|                    | $M_{max}$          | Nm         | 2.2                     | —    | —    |
| CMP50S             | $I_{max}$          | % $I_N$    | 133                     | —    | —    |
|                    | $M_{max}$          | Nm         | 3.2                     | —    | —    |
| CMP50M             | $I_{max}$          | % $I_N$    | 221                     | —    | —    |
|                    | $M_{max}$          | Nm         | 5.8                     | —    | —    |
| CMP50L             | $I_{max}$          | % $I_N$    | 250                     | 165  | —    |
|                    | $M_{max}$          | Nm         | 7.2                     | 9.2  | —    |
| CMP63S             | $I_{max}$          | % $I_N$    | 250                     | 141  | —    |
|                    | $M_{max}$          | Nm         | 6.0                     | 6.6  | —    |
| CMP63M             | $I_{max}$          | % $I_N$    | —                       | 233  | —    |
|                    | $M_{max}$          | Nm         | —                       | 12.1 | —    |
| CMP63L             | $I_{max}$          | % $I_N$    | —                       | 250  | 160  |
|                    | $M_{max}$          | Nm         | —                       | 13.5 | 16.6 |

#### 10.3.2 Rated speed $n_N = 4500$ rpm

| Servomotor<br>Type | $I_N$<br>$I_{max}$ | [A]<br>[A] | MOVIAXIS® MXA<br>Size 1 |     |      |
|--------------------|--------------------|------------|-------------------------|-----|------|
|                    |                    |            | 2                       | 4   | 8    |
|                    |                    |            | 5                       | 10  | 20   |
| CMP40S             | $I_{max}$          | % $I_N$    | 169                     | —   | —    |
|                    | $M_{max}$          | Nm         | 1.3                     | —   | —    |
| CMP40M             | $I_{max}$          | % $I_N$    | 139                     | —   | —    |
|                    | $M_{max}$          | Nm         | 2.2                     | —   | —    |
| CMP50S             | $I_{max}$          | % $I_N$    | 183                     | —   | —    |
|                    | $M_{max}$          | Nm         | 3.2                     | —   | —    |
| CMP50M             | $I_{max}$          | % $I_N$    | 250                     | 144 | —    |
|                    | $M_{max}$          | Nm         | 4.9                     | 5.5 | —    |
| CMP50L             | $I_{max}$          | % $I_N$    | 250                     | 179 | —    |
|                    | $M_{max}$          | Nm         | 5.1                     | 6.9 | —    |
| CMP63S             | $I_{max}$          | % $I_N$    | 250                     | 188 | —    |
|                    | $M_{max}$          | Nm         | 4.5                     | 6.1 | —    |
| CMP63M             | $I_{max}$          | % $I_N$    | —                       | 250 | 161  |
|                    | $M_{max}$          | Nm         | —                       | 9.0 | 10.9 |
| CMP63L             | $I_{max}$          | % $I_N$    | —                       | —   | 203  |
|                    | $M_{max}$          | Nm         | —                       | —   | 14.4 |



### 10.4 Brake

The mechanical brake is a holding brake implemented as a spring-loaded brake.

The brake has a standard supply voltage of DC 24 V and operates with 1 or 2 braking torque ratings for each motor size (CMP40, CMP50 and CMP63).

The brake cannot be retrofitted and operates without brake rectifier or brake control unit.

If the servomotors are run on inverters from SEW-EURODRIVE, overvoltage protection is provided.

If the servomotors are run on non-SEW-inverters, overvoltage protection must be implemented by the customers themselves using, for example, varistors.

Observe the notes in the relevant operating instructions for servo controllers concerning the switching sequence of motor enable and brake control during standard operation.

#### 10.4.1 Speed ratings

The BP brake can be used for the following rated speeds:

| Servomotor | Rated speed |
|------------|-------------|
| CMP40      | 3000 / 4500 |
| CMP50      | 3000 / 4500 |
| CMP63      | 3000 / 4500 |

#### 10.4.2 Basic structure of the BP holding brake for CMP40/50/63

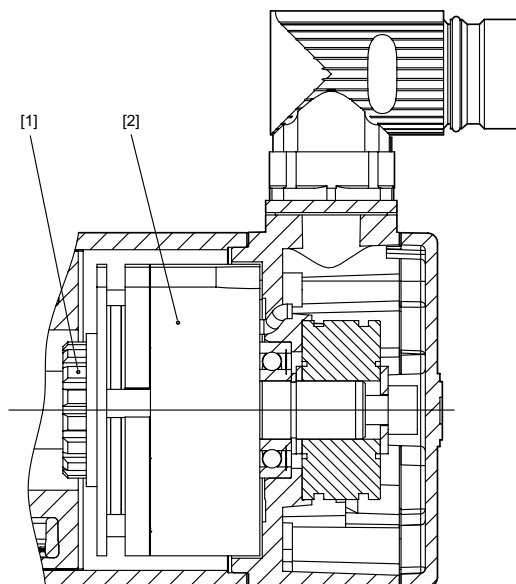
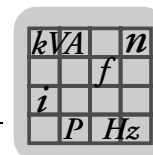


Figure 1: Principle structure of the 24 V spring-loaded BP

55832AXX

- [1] Carrier
- [2] Complete brake



### 10.4.3 Technical data of the BP holding brake

The table below shows the technical data of the BP holding brake. For the operating voltage, the tolerance is  $\pm 10\%$ . The type and number of brake springs determines the level of the braking torque. Unless specified otherwise in the order, the maximum braking torque MB1 is installed as standard. Other brake spring combinations can allow for realizing the optional braking torque values MB2.

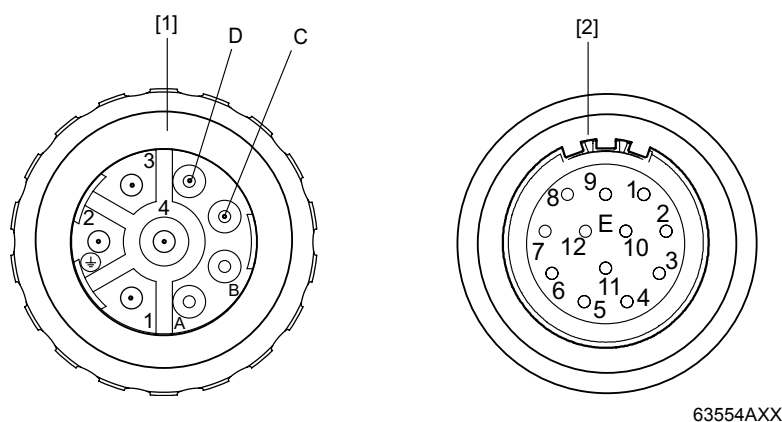
| Brake type | Motor type | $V_N$<br>[V <sub>DC</sub> ] | $I_B$<br>[A] | $M_{B1}$<br>[Nm] | $M_{B2}$<br>[Nm] | W<br>[kJ] | $W_{tot}$<br>[MJ] | $t_1$<br>[10 <sup>-3</sup> s] | $t_2$<br>[10 <sup>-3</sup> s] | $P_B$<br>[W] | $R_B$ |
|------------|------------|-----------------------------|--------------|------------------|------------------|-----------|-------------------|-------------------------------|-------------------------------|--------------|-------|
| BP01       | CMP40      | 24                          | 0.29         | 0.95             | –                | 0.4       | 1                 | 20                            | 10                            | 7            | 84    |
| BP04       | CMP50S     | 24                          | 0.42         | 3.1              | 4.3              | 0.6       | 1.5               | 40                            | 10                            | 10           | 54    |
|            | CMP50M/L   |                             |              | 4.3              | 3.1              |           |                   |                               |                               |              |       |
| BP09       | CMP63S     | 24                          | 0.67         | 7                | 9.3              | 1.0       | 2.5               | 60                            | 10                            | 16           | 35    |
|            | CMP63M/L   |                             |              | 9.3              | 7                |           |                   |                               |                               |              |       |

- $P_B$  Power consumption  
 $I_B$  Brake coil current at 20 °C  
 $M_{B1}$  Preferred braking torque  
 $M_{B2}$  Optional braking torque  
W Permitted friction work per cycle  
 $t_1$  Response time  
 $t_2$  Application time  
 $V_N$  Rated voltage  
 $R_B$  Resistance  
 $W_{tot}$  Total permitted friction work

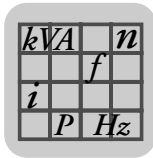
The response and application times are recommended values in relation to the maximum braking torque.

The tolerance of the braking torque is: +50% / -10%.

### Brake connection



- [1] Power connection  
[2] Feedback connection  
C + 24 V  
D 0 V

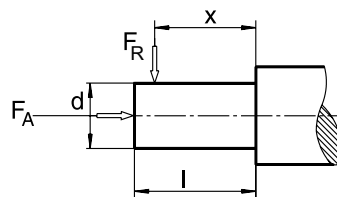


### 10.5 Overhung loads and axial loads

The following overhung loads are determined by subjecting the shaft to a load with the rated torque.

The permitted overhung loads  $F_q$  at point x (distance from the shaft shoulder to the application point) are determined using the diagrams below. The diagrams are based on the following nominal bearing service life:

| Motor type | Nominal bearing service life |
|------------|------------------------------|
| CMP40      | L10h = 25000 h               |
| CMP50      | L10h = 25000 h               |
| CMP63      | L10h = 20,000 h              |



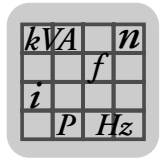
05590AXX

Figure 2: Determining the overhung load  $F_R$

#### 10.5.1 Permitted overhung and axial loads

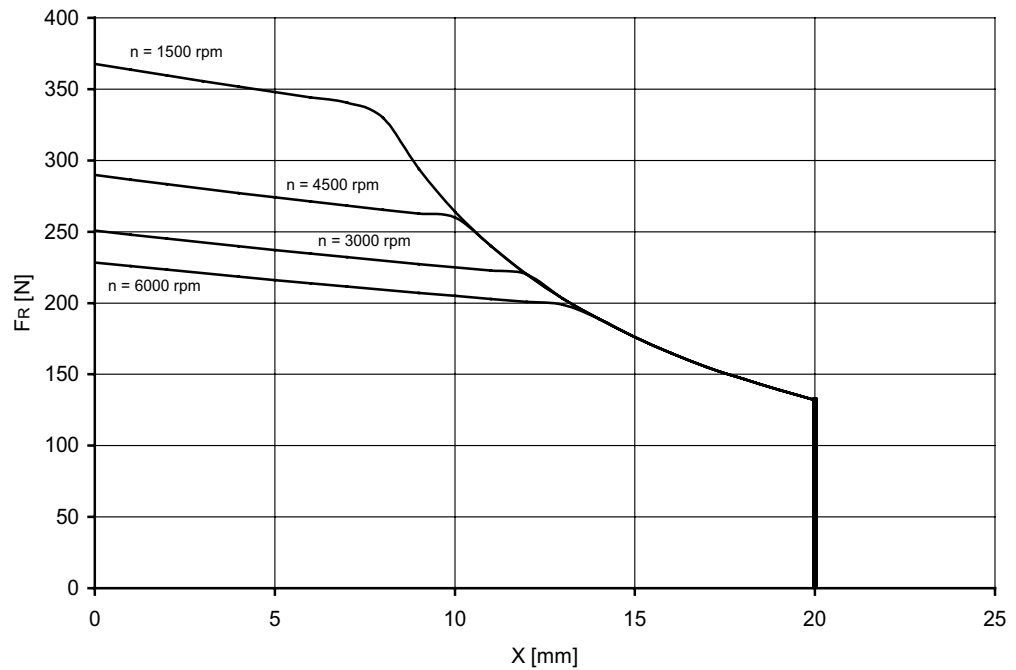
| Motor type | $F_{q \max}$ [N]<br>$F_A$ [N] | Mean speed <sup>1)</sup> [rpm] |      |      |      |
|------------|-------------------------------|--------------------------------|------|------|------|
|            |                               | 1500                           | 3000 | 4500 | 6000 |
| CMP40S     | $F_{q \max}$                  | 264                            | 260  | 225  | 205  |
|            | $F_A$                         | 109                            | 86   | 74   | 68   |
| CMP40M     | $F_{q \max}$                  | 264                            | 264  | 245  | 220  |
|            | $F_A$                         | 116                            | 92   | 81   | 73   |
| CMP50S     | $F_{q \max}$                  | 400                            | 315  | 250  | 200  |
|            | $F_A$                         | 157                            | 104  | 83   | 66   |
| CMP50M     | $F_{q \max}$                  | 400                            | 355  | 275  | 220  |
|            | $F_A$                         | 168                            | 117  | 91   | 73   |
| CMP50L     | $F_{q \max}$                  | 400                            | 370  | 280  | 225  |
|            | $F_A$                         | 182                            | 122  | 92   | 74   |
| CMP63S     | $F_{q \max}$                  | 578                            | 460  | 360  | 290  |
|            | $F_A$                         | 170                            | 115  | 90   | 72.5 |
| CMP63M     | $F_{q \max}$                  | 578                            | 500  | 380  | 300  |
|            | $F_A$                         | 188                            | 125  | 95   | 75   |
| CMP63L     | $F_{q \max}$                  | 578                            | 560  | 445  | 360  |
|            | $F_A$                         | 208                            | 140  | 111  | 90   |

1) The mean speed must, for example, be determined from the travel diagram.



**Permitted overhung load for CMP40S**

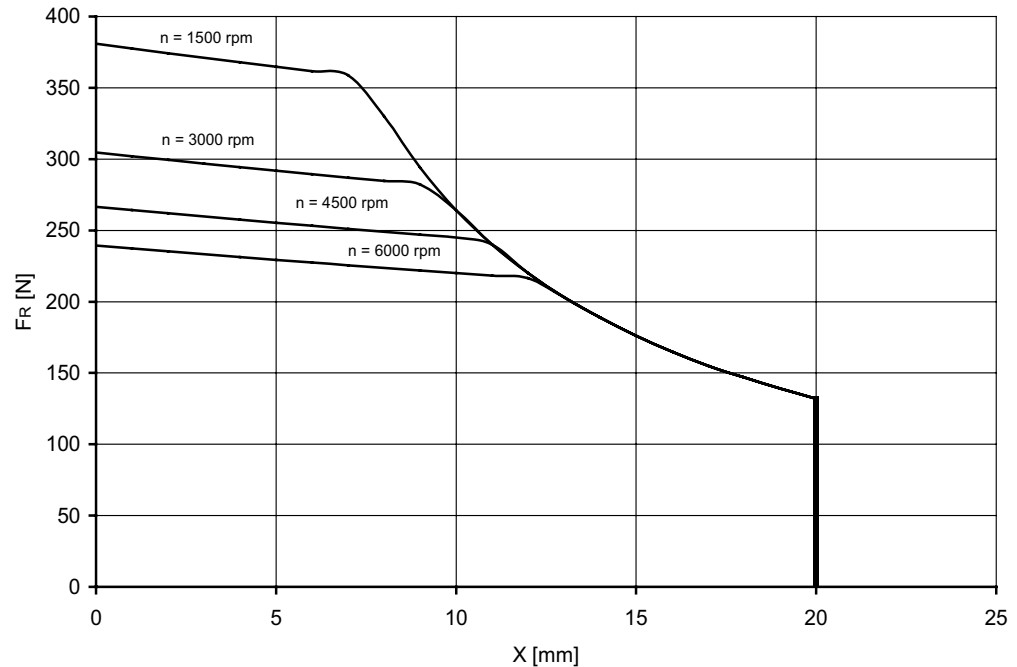
The following figure shows the permitted overhung load at point X.



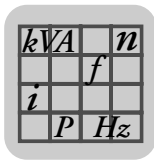
58648AXX

**Permitted overhung load for CMP40M**

The following figure shows the permitted overhung load at point X.

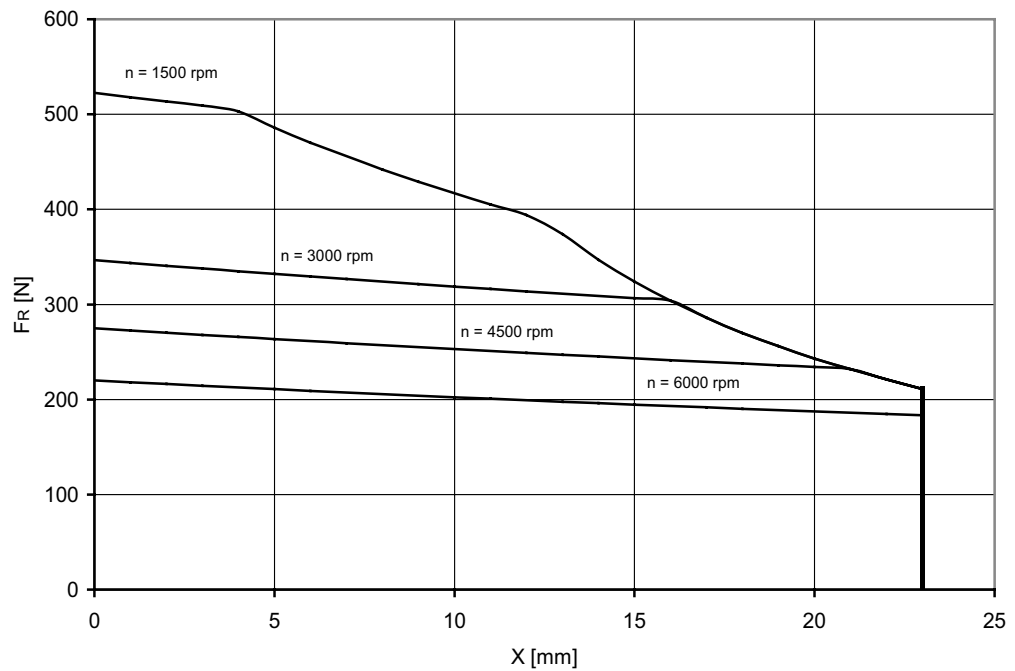


58649AXX



**Permitted overhung load for CMP50S**

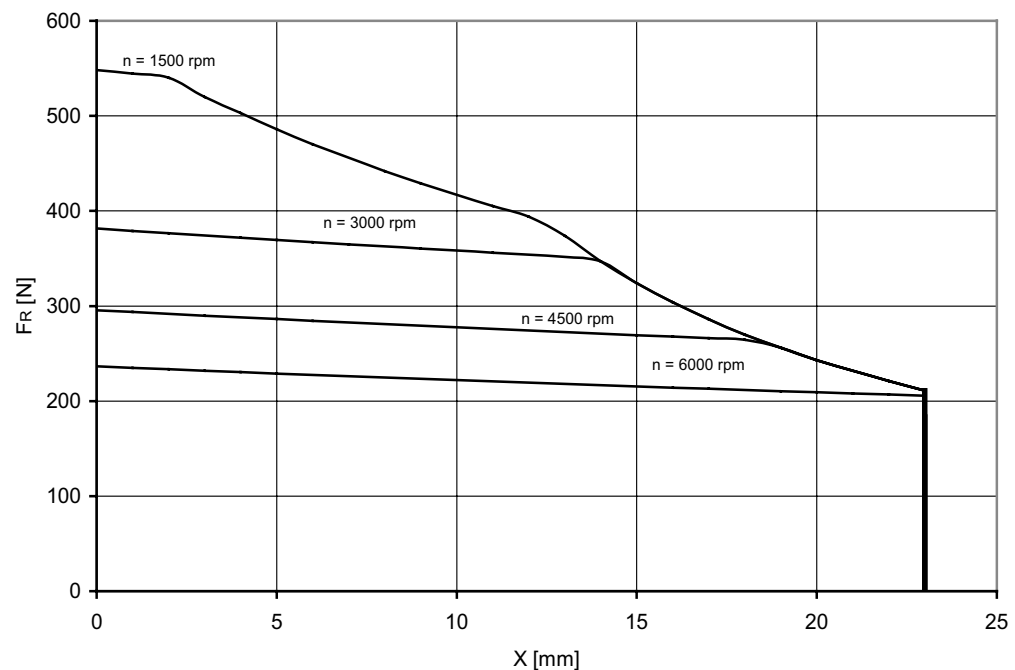
The following figure shows the permitted overhung load at point X.



58650AXX

**Permitted overhung load for CMP50M**

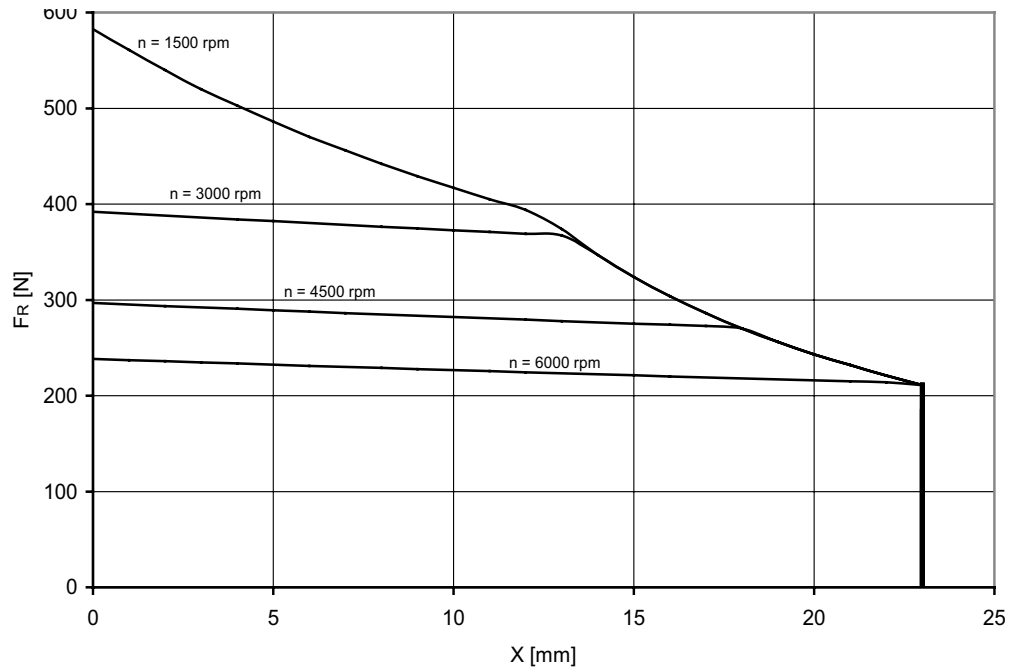
The following figure shows the permitted overhung load at point X.



58651AXX

**Permitted overhung load for CMP50L**

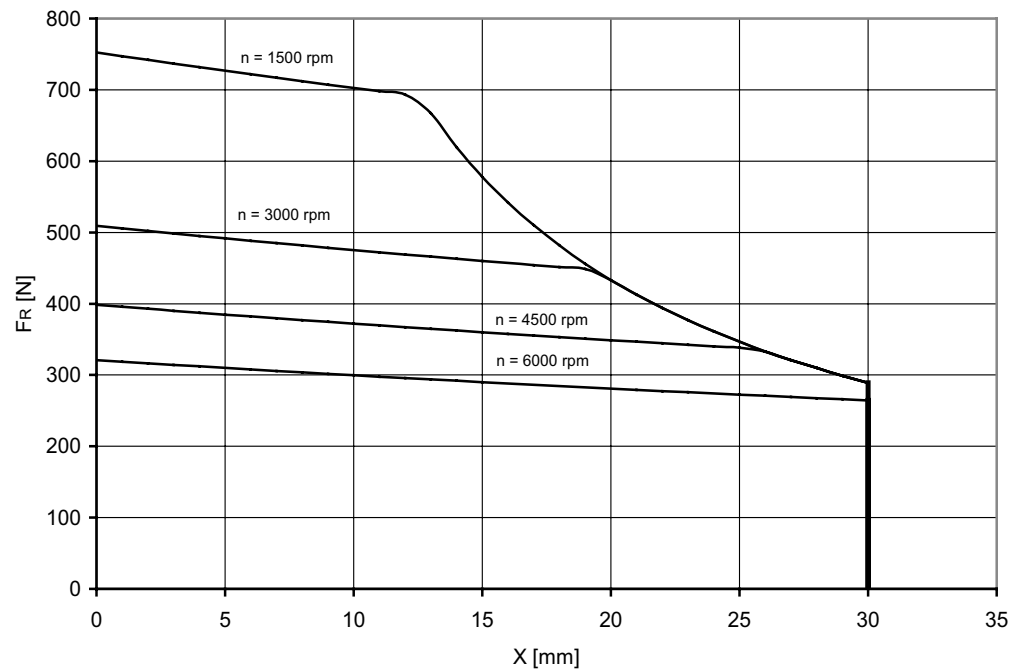
The following figure shows the permitted overhung load at point X.



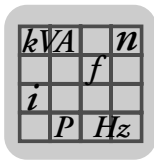
58652AXX

**Permitted overhung load for CMP63S**

The following figure shows the permitted overhung load at point X.



58653AXX

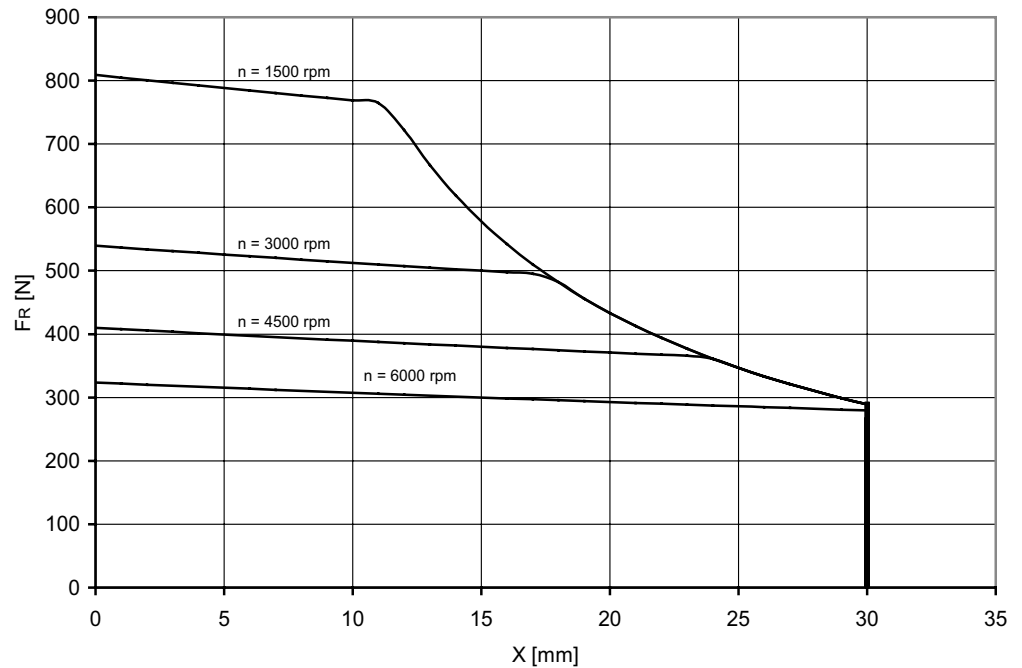


## Technical Data

### Overhung loads and axial loads

#### Permitted overhung load for CMP63M

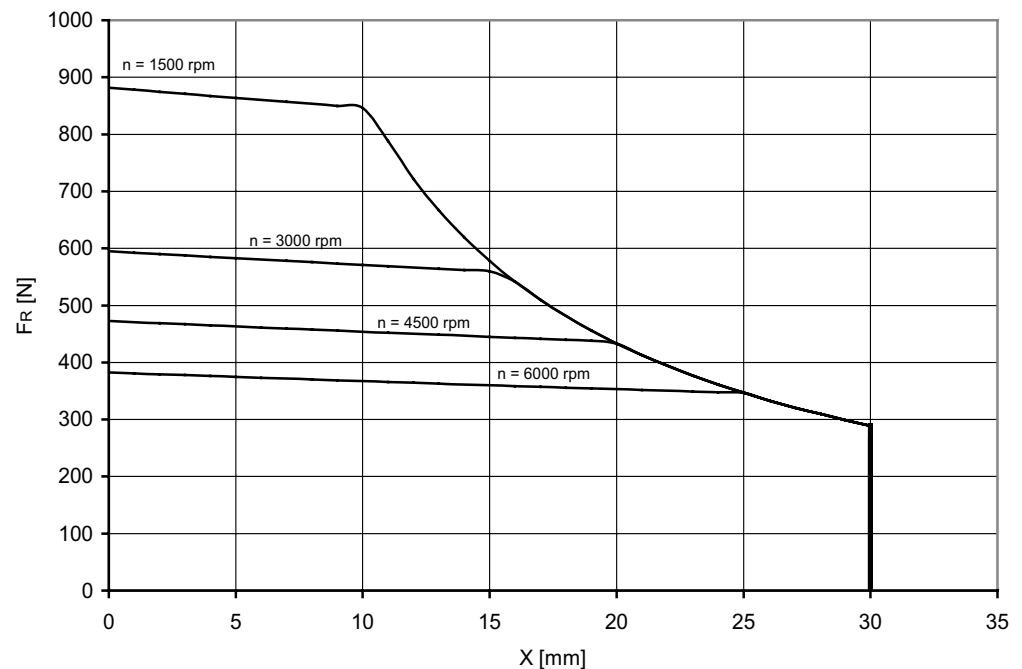
The following figure shows the permitted overhung load at point X.



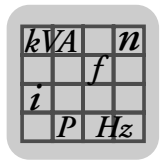
58654AXX

#### Permitted overhung load for CMP63L

The following figure shows the permitted overhung load at point X.



58655AXX



## 10.6 Dynamic and thermal characteristic curves

Definition:

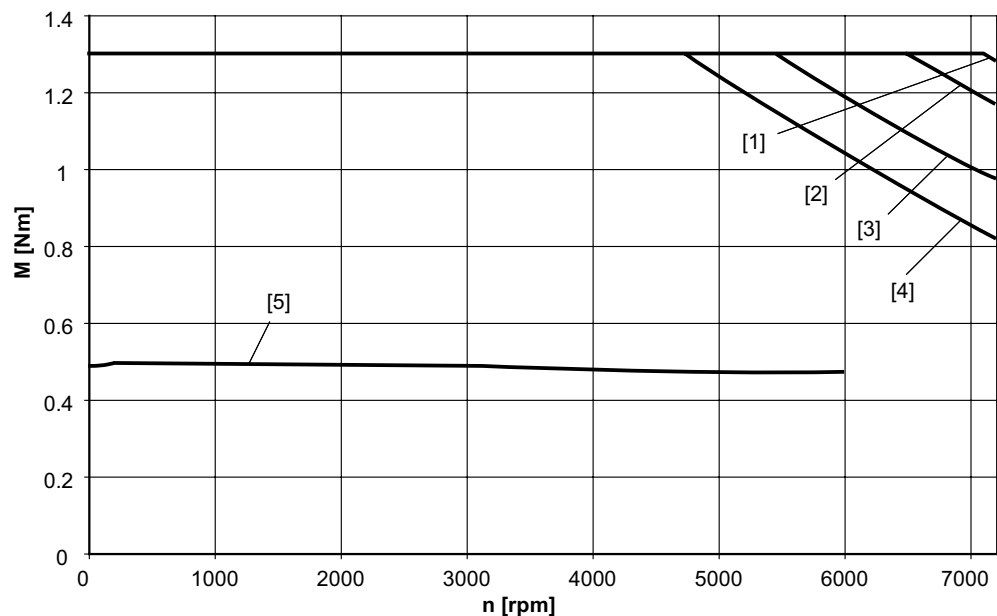
- $M$  = maximum dynamic torque for a maximum supply voltage on the servo inverter of 360 V, 400 V, 460 V or 500 V.
- $M_{S1}$  (derating) = thermal limit characteristic curve in S1 - 100 % operation.



### NOTE

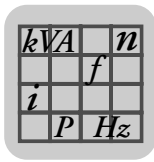
The following restriction applies for the limiting curve of the servomotors in general: Operation is only permitted up to a maximum speed of 4500 rpm.

### 10.6.1 Dynamic and thermal limit characteristic curve for CMP40S $n_N = 3000$ rpm

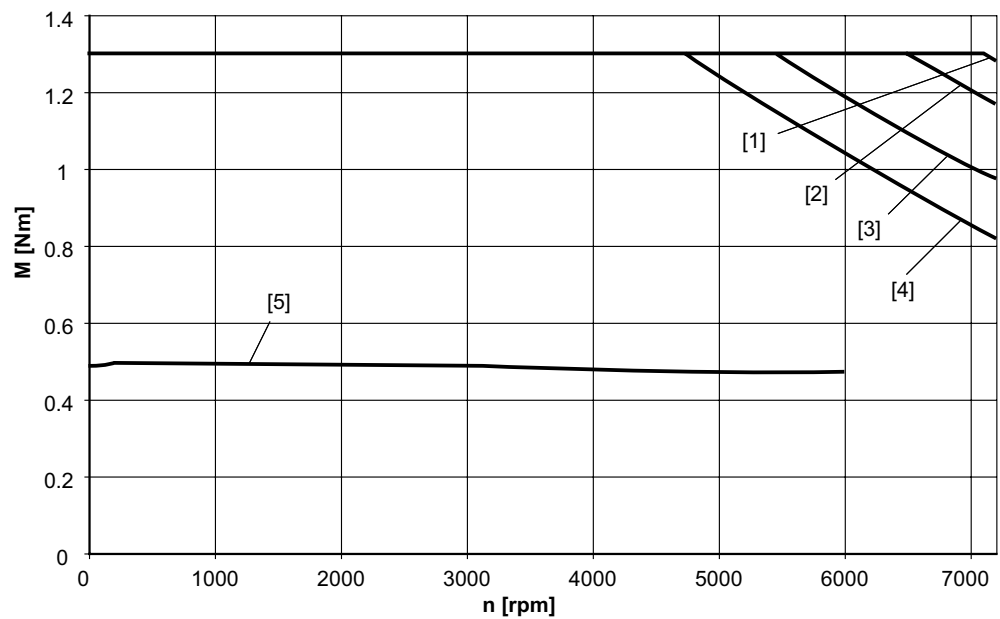


63167AXX

- |                                   |                                          |
|-----------------------------------|------------------------------------------|
| [1] $M_{\text{dynamic}}(n)$ 500 V | [4] $M_{\text{dynamic}}(n)$ 360 V        |
| [2] $M_{\text{dynamic}}(n)$ 460 V | [5] $M_{S1_{\text{thermal}}}$ (derating) |
| [3] $M_{\text{dynamic}}(n)$ 400 V |                                          |



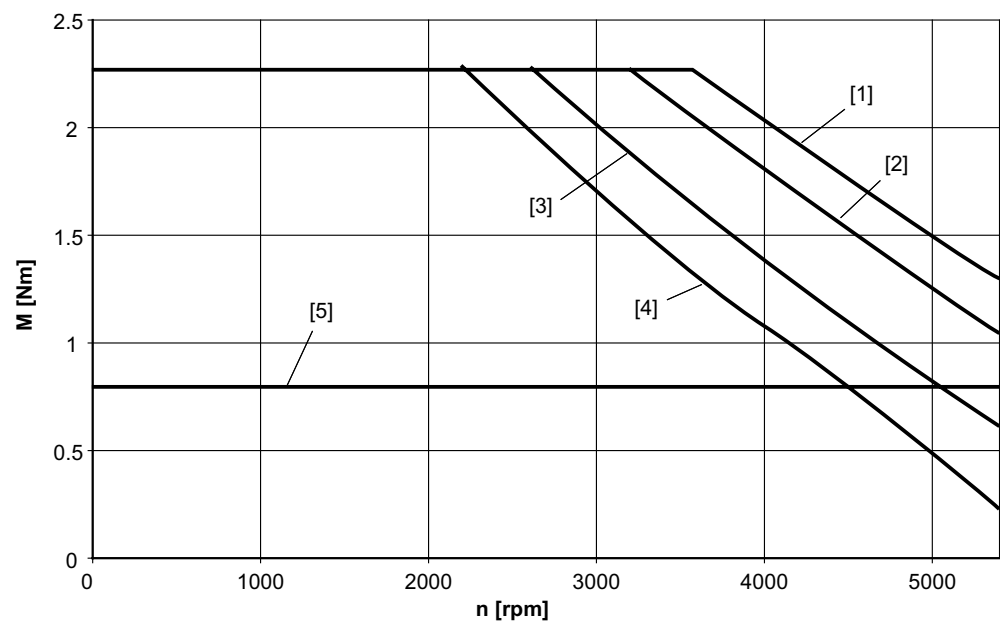
### 10.6.2 Dynamic and thermal limit characteristic curve for CMP40S $n_N = 4500$ rpm



63167AXX

- |                                           |                                              |
|-------------------------------------------|----------------------------------------------|
| [1] $M_{\text{dynamic}}(n) 500 \text{ V}$ | [4] $M_{\text{dynamic}}(n) 360 \text{ V}$    |
| [2] $M_{\text{dynamic}}(n) 460 \text{ V}$ | [5] $M S1_{\text{thermal}}(\text{derating})$ |
| [3] $M_{\text{dynamic}}(n) 400 \text{ V}$ |                                              |

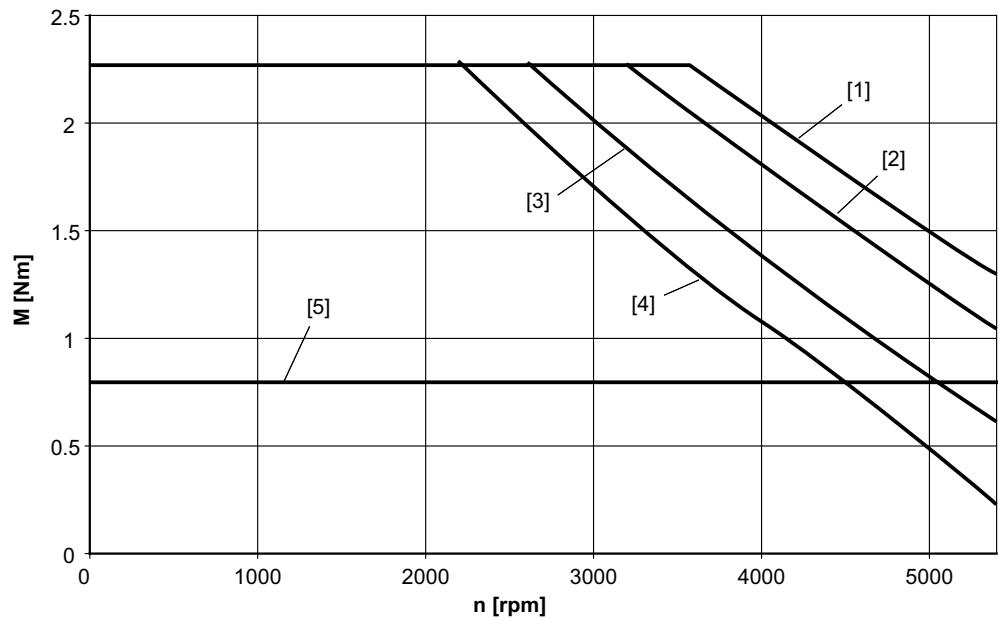
### 10.6.3 Dynamic and thermal limit characteristic curve for CMP40M $n_N = 3000$ rpm



63164AXX

- |                                           |                                              |
|-------------------------------------------|----------------------------------------------|
| [1] $M_{\text{dynamic}}(n) 500 \text{ V}$ | [4] $M_{\text{dynamic}}(n) 360 \text{ V}$    |
| [2] $M_{\text{dynamic}}(n) 460 \text{ V}$ | [5] $M S1_{\text{thermal}}(\text{derating})$ |
| [3] $M_{\text{dynamic}}(n) 400 \text{ V}$ |                                              |

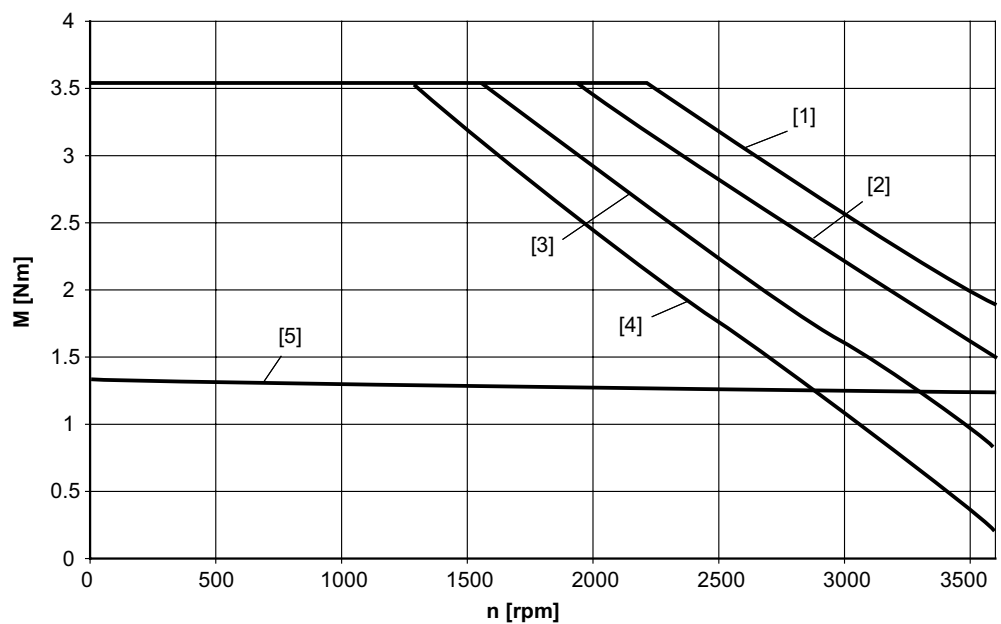
#### 10.6.4 Dynamic and thermal limit characteristic curve for CMP40M $n_N = 4500$ rpm



63163AXX

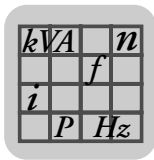
- |                                   |                                              |
|-----------------------------------|----------------------------------------------|
| [1] $M_{\text{dynamic}}(n)$ 500 V | [4] $M_{\text{dynamic}}(n)$ 360 V            |
| [2] $M_{\text{dynamic}}(n)$ 460 V | [5] $M S1_{\text{thermal}}(\text{derating})$ |
| [3] $M_{\text{dynamic}}(n)$ 400 V |                                              |

#### 10.6.5 Dynamic and thermal limit characteristic curve for CMP50S $n_N = 3000$ rpm

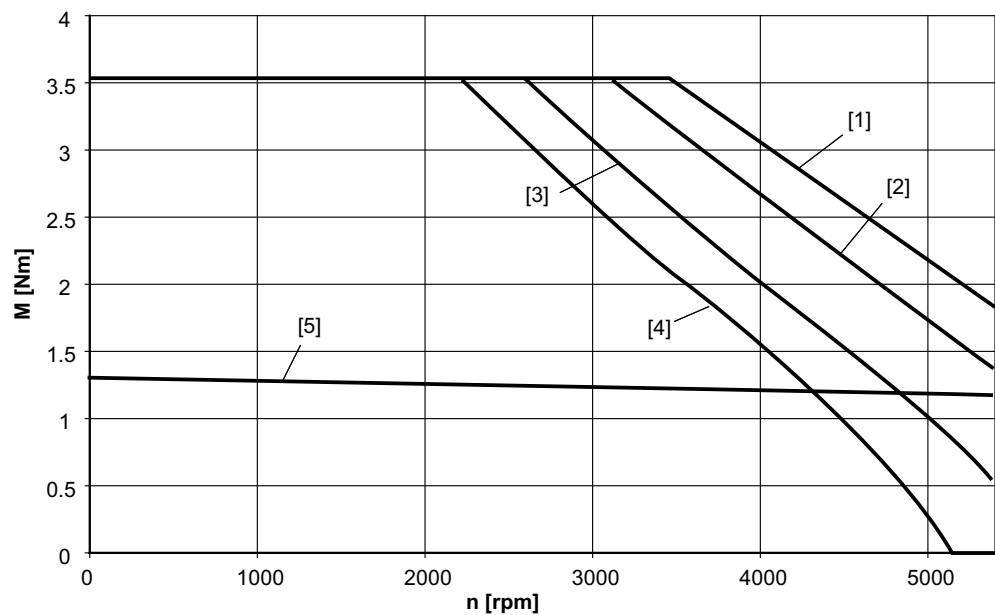


63162AXX

- |                                   |                                              |
|-----------------------------------|----------------------------------------------|
| [1] $M_{\text{dynamic}}(n)$ 500 V | [4] $M_{\text{dynamic}}(n)$ 360 V            |
| [2] $M_{\text{dynamic}}(n)$ 460 V | [5] $M S1_{\text{thermal}}(\text{derating})$ |
| [3] $M_{\text{dynamic}}(n)$ 400 V |                                              |



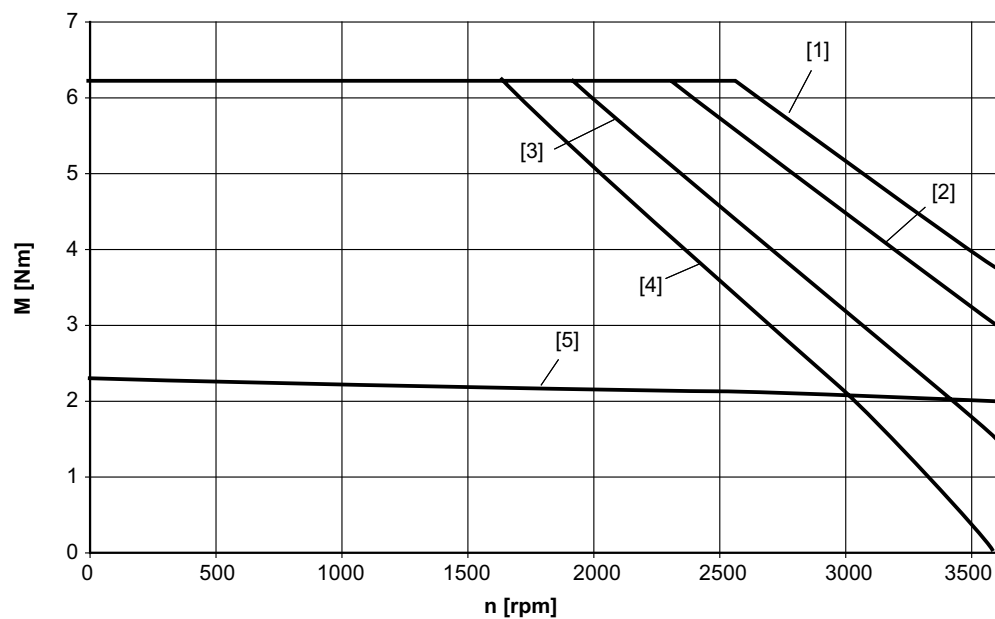
### 10.6.6 Dynamic and thermal limit characteristic curve for CMP50S $n_N = 4500$ rpm



63161AXX

- |                            |                                 |
|----------------------------|---------------------------------|
| [1] $M_{dynamic}(n)$ 500 V | [4] $M_{dynamic}(n)$ 360 V      |
| [2] $M_{dynamic}(n)$ 460 V | [5] $M S1_{thermal}$ (derating) |
| [3] $M_{dynamic}(n)$ 400 V |                                 |

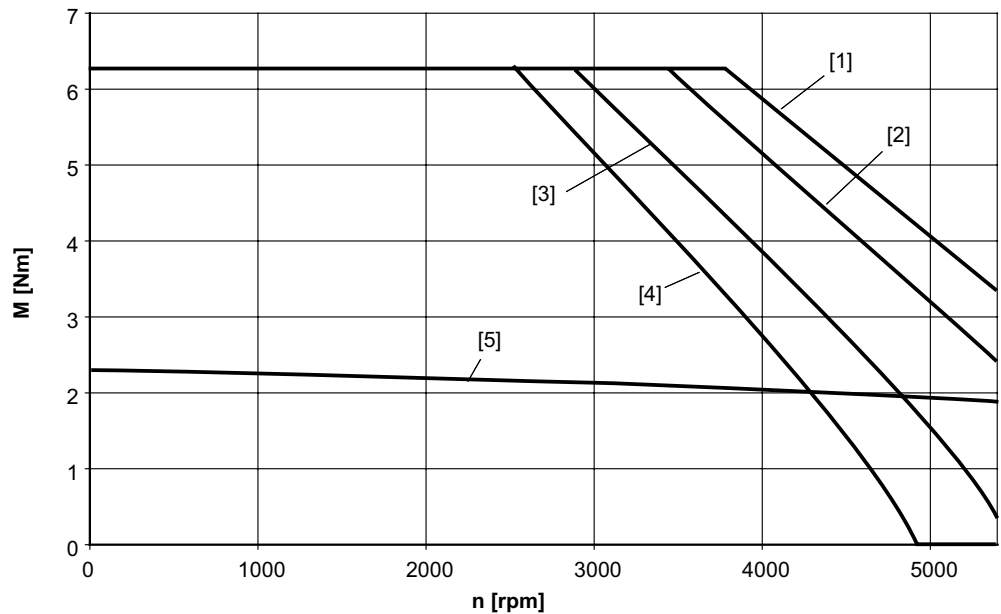
### 10.6.7 Dynamic and thermal limit characteristic curve for CMP50M $n_N = 3000$ rpm



63160AXX

- |                            |                                 |
|----------------------------|---------------------------------|
| [1] $M_{dynamic}(n)$ 500 V | [4] $M_{dynamic}(n)$ 360 V      |
| [2] $M_{dynamic}(n)$ 460 V | [5] $M S1_{thermal}$ (derating) |
| [3] $M_{dynamic}(n)$ 400 V |                                 |

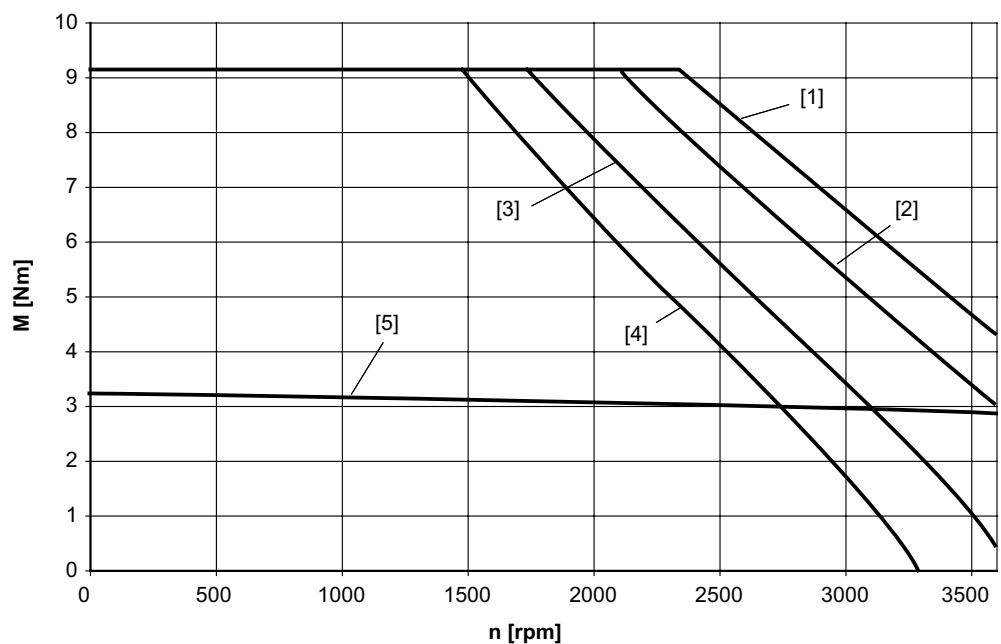
### 10.6.8 Dynamic and thermal limit characteristic curve for CMP50M $n_N = 4500$ rpm



63159AXX

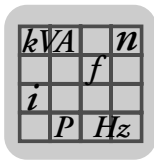
- |                                           |                                                |
|-------------------------------------------|------------------------------------------------|
| [1] $M_{\text{dynamic}}(n) 500 \text{ V}$ | [4] $M_{\text{dynamic}}(n) 360 \text{ V}$      |
| [2] $M_{\text{dynamic}}(n) 460 \text{ V}$ | [5] $M_{S1_{\text{thermal}}}(\text{derating})$ |
| [3] $M_{\text{dynamic}}(n) 400 \text{ V}$ |                                                |

### 10.6.9 Dynamic and thermal limit characteristic curve for CMP50L $n_N = 3000$ rpm

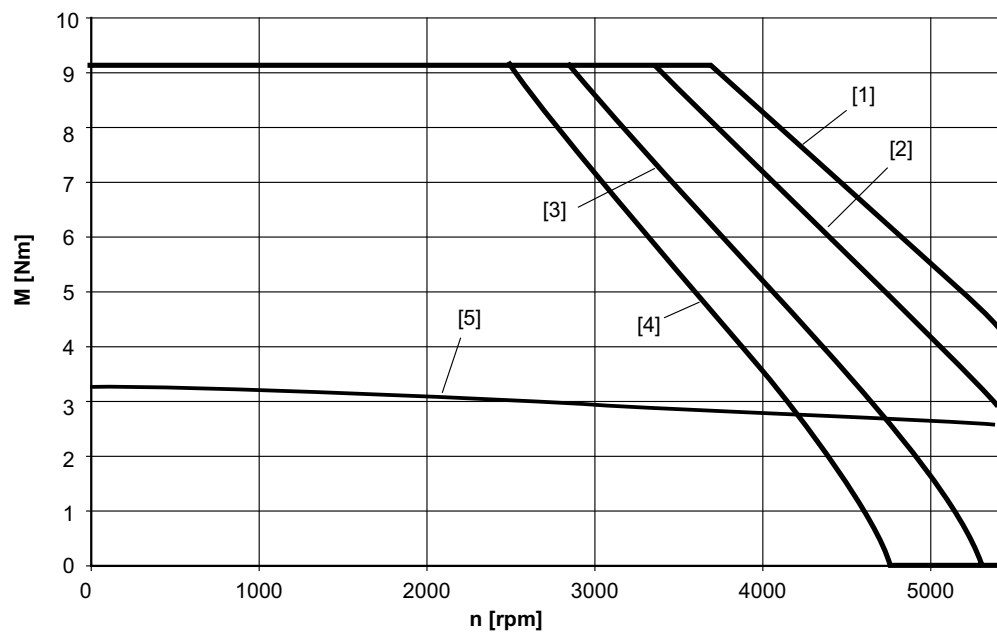


63158AXX

- |                                           |                                                |
|-------------------------------------------|------------------------------------------------|
| [1] $M_{\text{dynamic}}(n) 500 \text{ V}$ | [4] $M_{\text{dynamic}}(n) 360 \text{ V}$      |
| [2] $M_{\text{dynamic}}(n) 460 \text{ V}$ | [5] $M_{S1_{\text{thermal}}}(\text{derating})$ |
| [3] $M_{\text{dynamic}}(n) 400 \text{ V}$ |                                                |



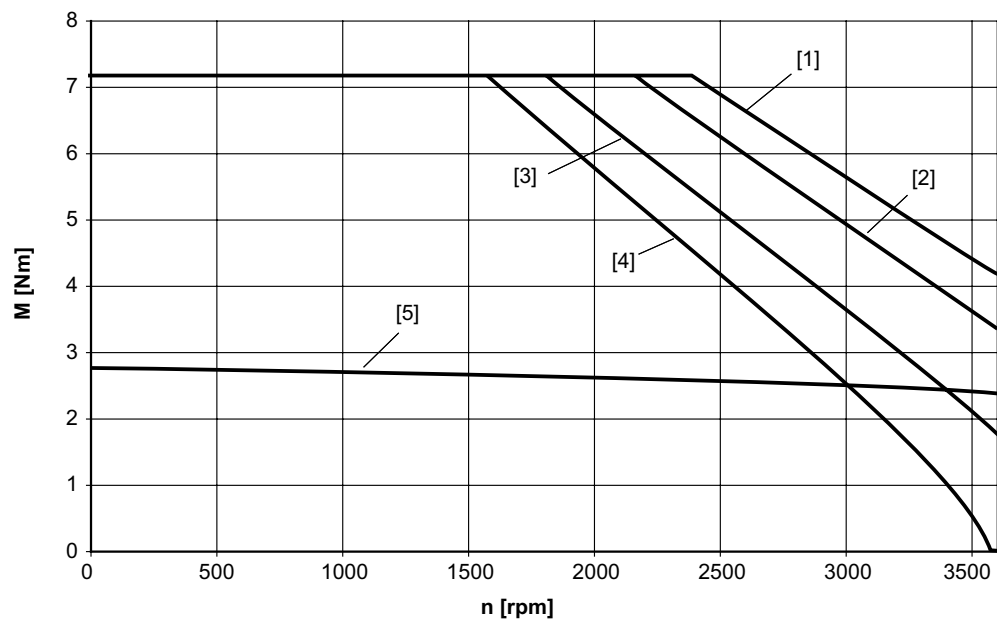
### 10.6.10 Dynamic and thermal limit characteristic curve for CMP50L $n_N = 4500$ rpm



63157AXX

- |                            |                                   |
|----------------------------|-----------------------------------|
| [1] $M_{dynamic}(n)$ 500 V | [4] $M_{dynamic}(n)$ 360 V        |
| [2] $M_{dynamic}(n)$ 460 V | [5] $M_{S1_{thermal}}$ (derating) |
| [3] $M_{dynamic}(n)$ 400 V |                                   |

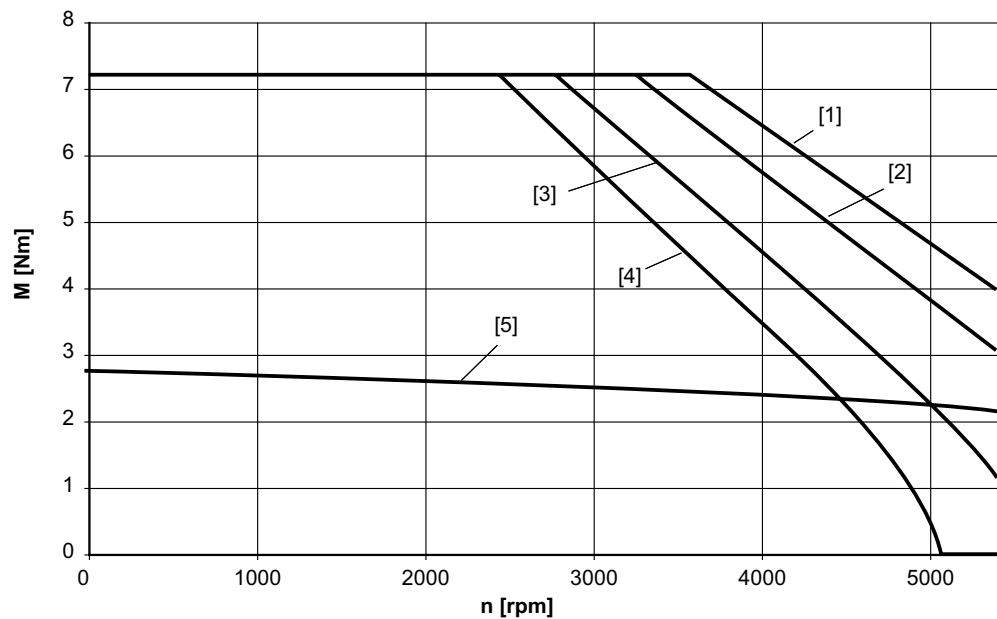
### 10.6.11 Dynamic and thermal limit characteristic curve for CMP63S $n_N = 3000$ rpm



63156AXX

- |                            |                                   |
|----------------------------|-----------------------------------|
| [1] $M_{dynamic}(n)$ 500 V | [4] $M_{dynamic}(n)$ 360 V        |
| [2] $M_{dynamic}(n)$ 460 V | [5] $M_{S1_{thermal}}$ (derating) |
| [3] $M_{dynamic}(n)$ 400 V |                                   |

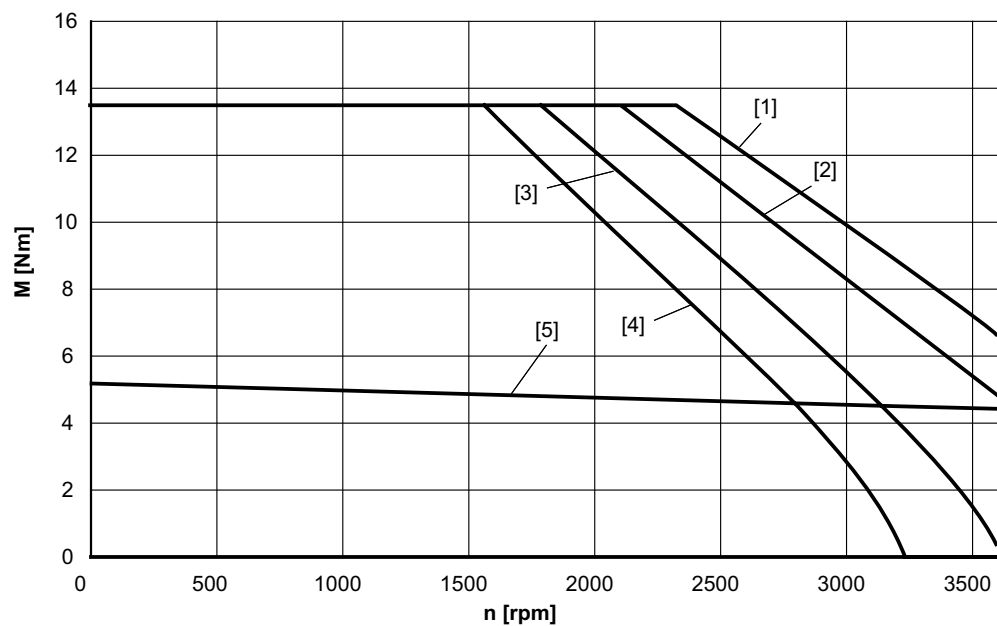
### 10.6.12 Dynamic and thermal limit characteristic curve for CMP63S $n_N = 4500$ rpm



63154AXX

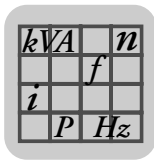
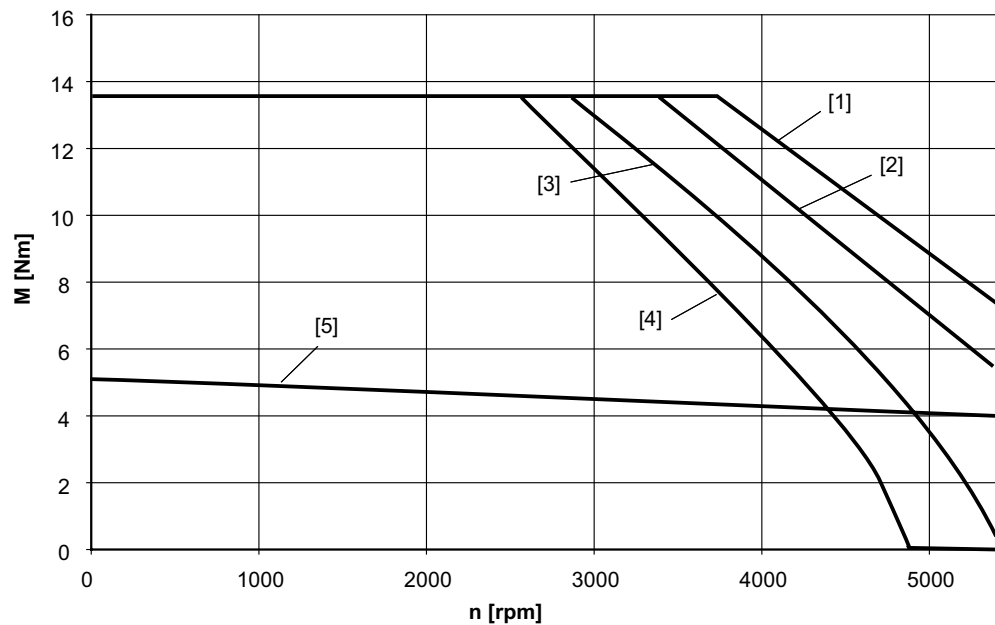
- |                                           |                                                |
|-------------------------------------------|------------------------------------------------|
| [1] $M_{\text{dynamic}}(n) 500 \text{ V}$ | [4] $M_{\text{dynamic}}(n) 360 \text{ V}$      |
| [2] $M_{\text{dynamic}}(n) 460 \text{ V}$ | [5] $M_{S1_{\text{thermal}}}(\text{derating})$ |
| [3] $M_{\text{dynamic}}(n) 400 \text{ V}$ |                                                |

### 10.6.13 Dynamic and thermal limit characteristic curve for CMP63M $n_N = 3000$ rpm



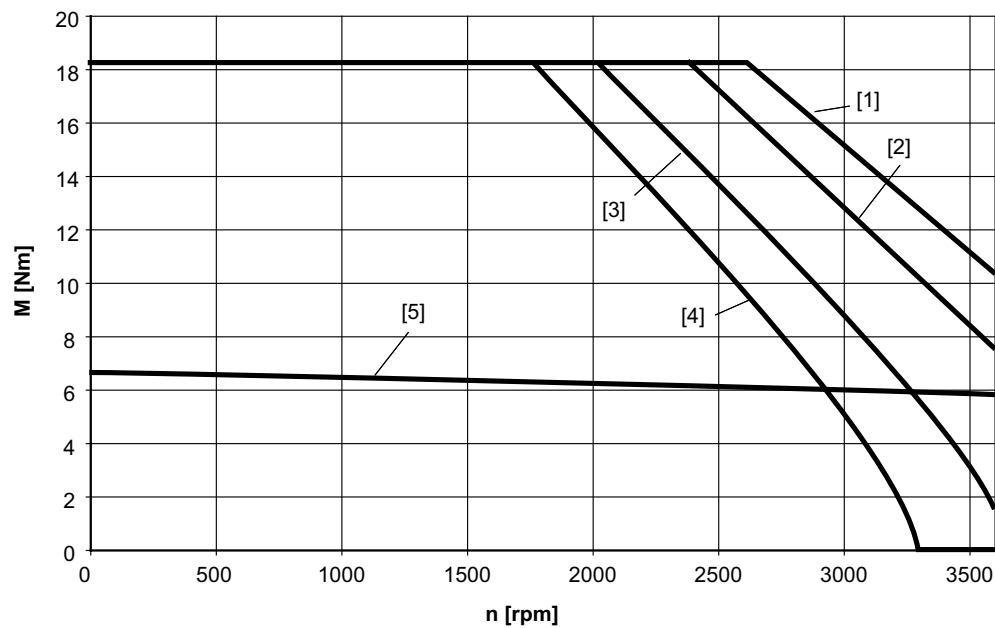
63153AXX

- |                                           |                                                |
|-------------------------------------------|------------------------------------------------|
| [1] $M_{\text{dynamic}}(n) 500 \text{ V}$ | [4] $M_{\text{dynamic}}(n) 360 \text{ V}$      |
| [2] $M_{\text{dynamic}}(n) 460 \text{ V}$ | [5] $M_{S1_{\text{thermal}}}(\text{derating})$ |
| [3] $M_{\text{dynamic}}(n) 400 \text{ V}$ |                                                |

10.6.14 Dynamic and thermal limit characteristic curve for CMP63M  $n_N = 4500$  rpm

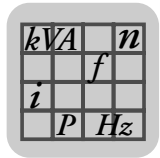
63152AXX

- |                            |                                   |
|----------------------------|-----------------------------------|
| [1] $M_{dynamic}(n)$ 500 V | [4] $M_{dynamic}(n)$ 360 V        |
| [2] $M_{dynamic}(n)$ 460 V | [5] $M_{S1_{thermal}}$ (derating) |
| [3] $M_{dynamic}(n)$ 400 V |                                   |

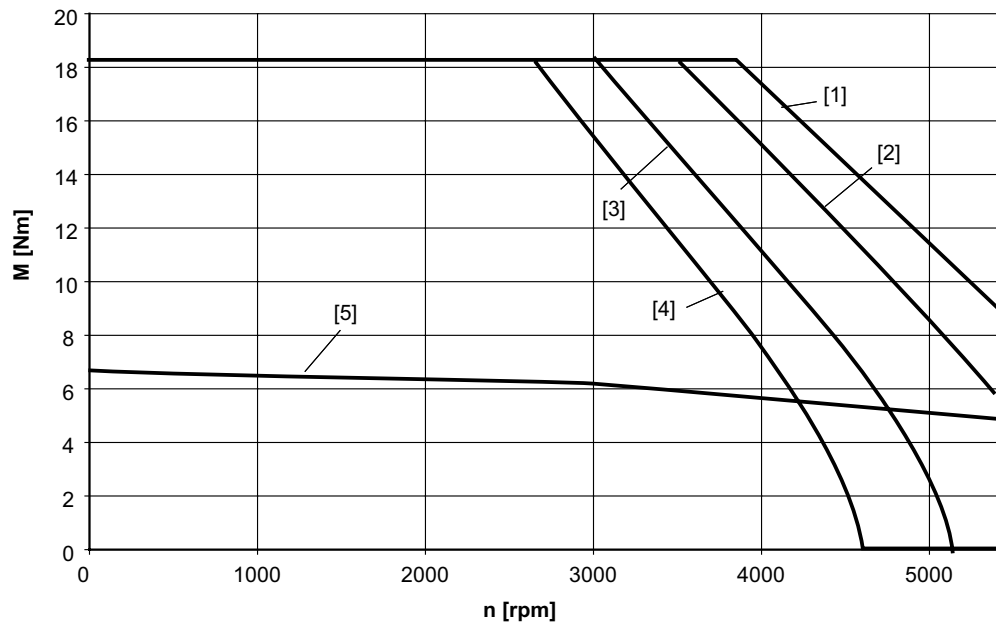
10.6.15 Dynamic and thermal limit characteristic curve for CMP63L  $n_N = 3000$  rpm

63150AXX

- |                            |                                   |
|----------------------------|-----------------------------------|
| [1] $M_{dynamic}(n)$ 500 V | [4] $M_{dynamic}(n)$ 360 V        |
| [2] $M_{dynamic}(n)$ 460 V | [5] $M_{S1_{thermal}}$ (derating) |
| [3] $M_{dynamic}(n)$ 400 V |                                   |



10.6.16 Dynamic and thermal limit characteristic curve for CMP63L  $n_N = 4500$  rpm



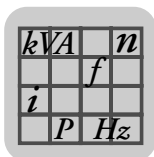
63149AXX

- |                                   |                                          |
|-----------------------------------|------------------------------------------|
| [1] $M_{\text{dynamic}}(n)$ 500 V | [4] $M_{\text{dynamic}}(n)$ 360 V        |
| [2] $M_{\text{dynamic}}(n)$ 460 V | [5] $M_{S1_{\text{thermal}}}$ (derating) |
| [3] $M_{\text{dynamic}}(n)$ 400 V |                                          |



**NOTE**

Servomotors can be operated up to **altitudes of 1000 m above sea level**. For operation at altitudes above 1000 m above sea level, consult SEW-EURODRIVE.



## Technical Data

Permitted ball bearing types (category 3)

### 10.7 Permitted ball bearing types (category 3)

| Motor type | A-side bearing | B-side bearing |
|------------|----------------|----------------|
| CMP40      | 6002-2Z        | 6001-2Z        |
| CMP50      | 6004-2Z        | 6001-2Z        |
| CMP63      | 6005-2Z        | 6003-2Z        |



## 11 Appendix

### 11.1 Declaration of conformity

#### EG-Konformitätserklärung

EC Declaration of Conformity

Déclaration CE de conformité



Nr./No./N° 900010008

im Sinne der Richtlinie 94/9/EG, Anhang VIII  
according to Directive 94/9/EC, Appendix VIII  
au sens de la directive 94/9/CE, Annexe VIII

**SEW EURODRIVE GmbH & Co KG**  
Ernst-Blickle-Straße 42, D-76646 Bruchsal

erklärt in alleiniger Verantwortung die Konformität der folgenden Produkte  
declares under sole responsibility conformity of the following products  
déclare, sous sa seule responsabilité, que les produits suivants

**Servomotoren der Baureihe:**  
Servo motors of the series:  
Servomoteurs de la série :

CMP40, CMP50, CMP63  
CM71, CM90, CM112

**Kategorie:**  
in category: / Catégories :

II 3G & II3D & II 3GD

**Kennzeichnung:**  
marking: / Codification :

II3G Ex nA II T3  
II3G Ex nA II T3 X  
II3D Ex tD A22 IP6X T150°C  
II3D Ex tD A22 IP6X T150°C X

**mit der**  
with the / respectent la

**Richtlinie**  
Directive / Directive

94/9 EG  
94/9 EC / 94/9/CE

**angewandte harmonisierte Normen:**  
Applied harmonized standards: / Normes harmonisées appliquées :

EN 60079-0:2006

ChangeLog

13-02-2008: Die Verwendung des Normentwurfs EN 60079-0:2004 endet am 01-10-2008

EN 60079-15:2005  
EN 61241-0:2006  
EN 61241-1:2004  
EN 60034-1:2004

**Ort/Datum**  
Place/date / Lieu et date

**Geschäftsführer Vertrieb und Marketing**  
Managing Director Sales and Marketing  
Directeur général international commercial et marketing

Bruchsal, 20.02.08

H. Sondermann

63259AXX



#### 11.2 Abbreviations and unit designations

| Abbreviation | Definition                                                                 | Meaning                                                                              |
|--------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| DIN          | Deutsches Institut für Normung e.V. (German institute for standardization) |                                                                                      |
| EN           | Europäische Norm (European standard)                                       |                                                                                      |
| ISO          | International Organization for Standardization                             | The ISO creates ISO standards that should be adopted unrevised by the member states. |
| SW           | Schlüsselweite (Wrench size)                                               |                                                                                      |



### 11.3 Crimping tools

An alternative for purchasing the prefabricated cables from SEW-EURODRIVE for motors with plug connectors is to purchase the required plug connectors.

In this case, the customers have to wire the plug connectors themselves. SEW-EURODRIVE offers the matching crimping tools to ensure correct connection of cable core and contact. Please quote the required part number in your order.

#### 11.3.1 Crimping tool for CMP.. power and brake contacts

##### Required tools for cable assembly

For the following tool, different crimping jaws are required for assembling/disassembling different cross sections.

| Type               | SEW part number | Contact cross section<br>Core cross section |         | Illustration                                                                        |
|--------------------|-----------------|---------------------------------------------|---------|-------------------------------------------------------------------------------------|
|                    |                 | Power                                       | Brake   |                                                                                     |
| Crimping tool      | 0190705         | Ø3.6 mm                                     | Ø1.6 mm |  |
|                    |                 | 0.5 ... 6.0 mm <sup>2</sup>                 |         |                                                                                     |
| Crimping jaws      | –               | Ø1.6 mm<br>0.5 ... 1.5 mm <sup>2</sup>      |         |                                                                                     |
| Contact receptacle | –               |                                             |         |                                                                                     |
| Crimping jaws      | 0190128         | Ø3.6 mm<br>1.5 ... 2.5 mm <sup>2</sup>      | –       |                                                                                     |
| Contact receptacle | 0190144         |                                             | –       |                                                                                     |
| Crimping jaws      | 0190136         | Ø3.6 mm<br>4.0 ... 6.0 mm <sup>2</sup>      | –       |                                                                                     |
| Contact receptacle | 0190152         |                                             | –       |                                                                                     |
| Crimping tool      | 0190691         | Ø3.6 mm<br>1.5 ... 10 mm <sup>2</sup>       | –       |                                                                                     |
| Positioning tool   | 0190713         |                                             |         |                                                                                     |
| Test probe set     | 0190853         |                                             |         |                                                                                     |

##### Required tools for disassembling the plug connector on the motor end

No special tools are required for disassembly.



#### 11.3.2 Crimping tool for encoder and feedback system

##### *Required tools for cable assembly*

| Product                                                                   | Type             | SEW part number | Contact cross section<br>Core cross section<br>Signal | Illustration |
|---------------------------------------------------------------------------|------------------|-----------------|-------------------------------------------------------|--------------|
| RH1M(L) resolver<br>HIPERFACE®<br>• AS1H Multi-Turn<br>• ES1H Single-Turn | Crimping tool    | 0192430         | –                                                     |              |
|                                                                           | Positioning tool | 0192449         | Ø1 mm<br>0.06 ... 1 mm <sup>2</sup>                   |              |
| SSI Multi-Turn                                                            | Crimping tool    | 0192597         | –                                                     |              |
|                                                                           | Positioning tool | 0192600         | Ø1 mm<br>0.24 ... 1 mm <sup>2</sup>                   |              |

##### *Required tools for disassembling the plug connector on the motor end*

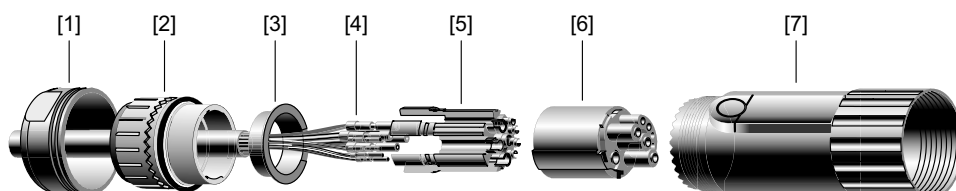
| Product                                                                   | Type                                           | SEW part number | Contact cross section<br>Core cross section<br>Signal |
|---------------------------------------------------------------------------|------------------------------------------------|-----------------|-------------------------------------------------------|
| RH1M(L) resolver<br>HIPERFACE®<br>• AS1H Multi-Turn<br>• ES1H Single-Turn | Removal tool                                   | 0192481         | Insulator                                             |
| SSI Multi-Turn                                                            | No special tools are required for disassembly. |                 |                                                       |



## 11.4 Power connector assembly

### 11.4.1 Scope of delivery power connectors

The following parts are supplied for assembling the power connectors. The SEW part number is 198 674 0.

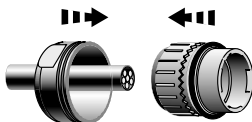
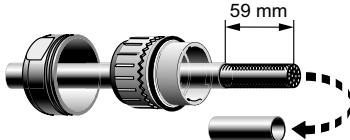
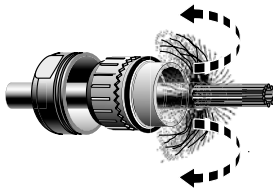
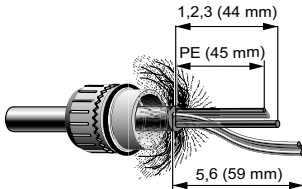
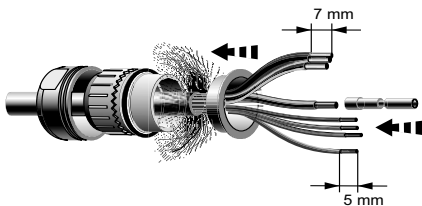
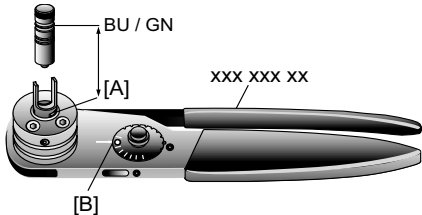


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- [1] Screw fitting
- [2] Seal with strain relief
- [3] Shield ring
- [4] Socket contacts
- [5] Insulating sleeve
- [6] Insulator
- [7] Connector housing



#### 11.4.2 Assembly instructions for the power connector

| <div></div> |                                                                                                | <div><b>STOP!</b></div> <div>The signal plug connector can be damaged if it is not assembled correctly.<br/>Potential damage to property!</div> <div><ul style="list-style-type: none"><li>Do not twist the cable during assembly.</li></ul></div>                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                |  |      |                      |                                              |                    |                |         |              |           |            |    |                |              |           |           |   |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|--|------|----------------------|----------------------------------------------|--------------------|----------------|---------|--------------|-----------|------------|----|----------------|--------------|-----------|-----------|---|
| 1                                                                                            | <div></div>   | <div><ul style="list-style-type: none"><li>Pull the screw fitting and the seal with strain relief over the cable.</li></ul></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |                |  |      |                      |                                              |                    |                |         |              |           |            |    |                |              |           |           |   |
| 2                                                                                            | <div></div>   | <div><ul style="list-style-type: none"><li>Strip 59 mm of cable insulation off the end of the cable.</li></ul></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                |  |      |                      |                                              |                    |                |         |              |           |            |    |                |              |           |           |   |
| 3                                                                                            | <div></div>  | <div><ul style="list-style-type: none"><li>Fold back the braided shield and fan it out.</li></ul></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                |  |      |                      |                                              |                    |                |         |              |           |            |    |                |              |           |           |   |
| 4                                                                                            | <div></div> | <div><ul style="list-style-type: none"><li>Shorten the power leads (1, 2 and 3) to 44 mm.</li><li>Shorten the PE lead (GN/YE) to 45 mm.</li><li>Do not shorten lead pair 5 and 6.</li><li>Cut off lead pair 7 and 8 flush with the end of the cable.</li></ul></div>                                                                                                                                                                                                                                                                                                                                                                                          |                    |                |  |      |                      |                                              |                    |                |         |              |           |            |    |                |              |           |           |   |
| 5                                                                                            | <div></div> | <div><ul style="list-style-type: none"><li>Pull the shield over the leads.</li><li>Strip 7 mm of insulation off leads 1, 2, 3 and PE.</li><li>Strip 5 mm of insulation of leads 5 and 6.</li></ul></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                |  |      |                      |                                              |                    |                |         |              |           |            |    |                |              |           |           |   |
| 6                                                                                            | <div></div> | <div><ul style="list-style-type: none"><li>Insert the positioning tool in the crimping tool until the marking (color) appears in the view window [A] appears (see table below).</li><li>Set the press thickness [B] on the crimping tool according to the table.</li></ul></div> <table><tr><th>Lead</th><th>a [mm<sup>2</sup>]</th><th>Positioning tool<br/>Part number<br/>xxx xxx x</th><th>Marking<br/>(color)</th><th>Press<br/>force</th></tr><tr><td>5 and 6</td><td>0.14 ... 1.0</td><td>019 244 9</td><td>Green (GN)</td><td>24</td></tr><tr><td>1, 2, 3 and PE</td><td>0.35 ... 4.0</td><td>019 245 7</td><td>Blue (BU)</td><td>6</td></tr></table> |                    |                |  | Lead | a [mm <sup>2</sup> ] | Positioning tool<br>Part number<br>xxx xxx x | Marking<br>(color) | Press<br>force | 5 and 6 | 0.14 ... 1.0 | 019 244 9 | Green (GN) | 24 | 1, 2, 3 and PE | 0.35 ... 4.0 | 019 245 7 | Blue (BU) | 6 |
| Lead                                                                                         | a [mm <sup>2</sup> ]                                                                           | Positioning tool<br>Part number<br>xxx xxx x                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Marking<br>(color) | Press<br>force |  |      |                      |                                              |                    |                |         |              |           |            |    |                |              |           |           |   |
| 5 and 6                                                                                      | 0.14 ... 1.0                                                                                   | 019 244 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Green (GN)         | 24             |  |      |                      |                                              |                    |                |         |              |           |            |    |                |              |           |           |   |
| 1, 2, 3 and PE                                                                               | 0.35 ... 4.0                                                                                   | 019 245 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Blue (BU)          | 6              |  |      |                      |                                              |                    |                |         |              |           |            |    |                |              |           |           |   |



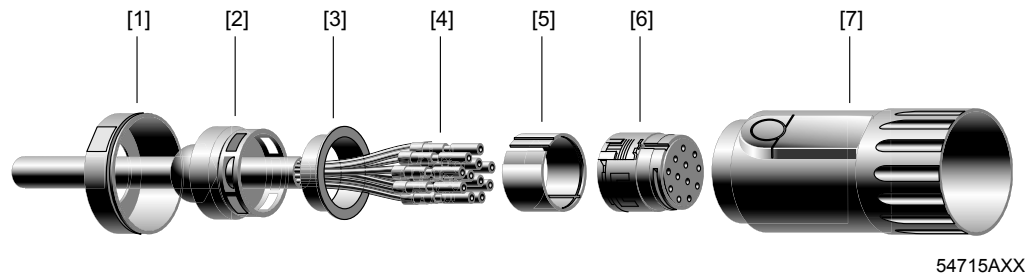
|    |  |                                                                                                                                                                                                                                                                                                     |
|----|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7  |  | <ul style="list-style-type: none"> <li>Insert a lead with socket contact in the crimping tool and press the tool fully together. The tool then opens automatically.</li> <li>Repeat this procedure for each lead in accordance with the table in step 6.</li> </ul>                                 |
| 8  |  | <ul style="list-style-type: none"> <li>Open the insulating sleeve.</li> </ul>                                                                                                                                                                                                                       |
| 9  |  | <ul style="list-style-type: none"> <li>Insert the middle socket contact into the insulator according to the wiring diagram.</li> <li>Close the insulating sleeve until it clicks shut.</li> <li>Insert the remaining socket contacts into the insulator according to the wiring diagram.</li> </ul> |
| 10 |  | <ul style="list-style-type: none"> <li>Shorten the braid shield as shown.</li> <li>Insert the shield ring into the seal so that the shield and end of the cable are flush. Make sure that the braided shield is routed cleanly between the shield ring and the seal.</li> </ul>                     |
| 11 |  | <ul style="list-style-type: none"> <li>Insert the insulator into the connector housing until the seal rests against its stop in the connector housing.</li> </ul>                                                                                                                                   |
| 12 |  | <ul style="list-style-type: none"> <li>Use a wrench to hold the connector housing in place and use a second wrench to tighten the screw fitting.</li> <li>[A] = Fix in place</li> </ul>                                                                                                             |



### 11.5 HIPERFACE® resolver signal plug connector assembly

#### 11.5.1 Scope of delivery signal plug connectors

The following parts are supplied for assembling resolver/HIPERFACE® plug connectors. The SEW part number is 198 673 2.



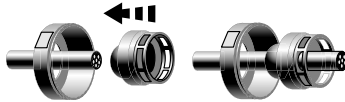
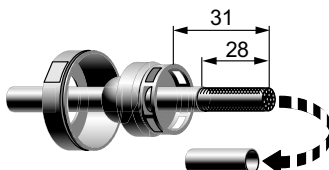
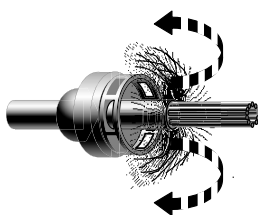
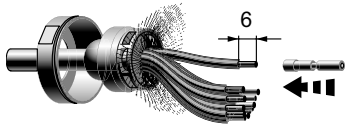
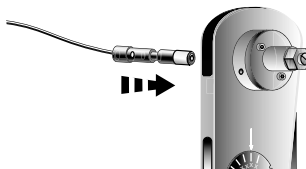
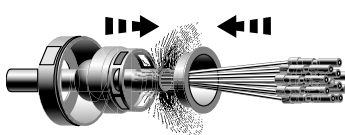
54715AXX

- [1] Screw fitting
- [2] Seal with strain relief
- [3] Shield ring
- [4] Socket contacts
- [5] Insulating sleeve
- [6] Insulator
- [7] Connector housing



### 11.5.2 Signal plug connectors assembly notes

|                                                                                   |                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>STOP!</b>                                                                                                                                                                                                  |
|                                                                                   | <p>The signal plug connector can be damaged if it is not assembled correctly.<br/>Potential damage to property!</p> <ul style="list-style-type: none"> <li>Do not twist the cable during assembly.</li> </ul> |

|   |                                                                                     |                                                                                                                                                                                                                                                                       |
|---|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 |    | <ul style="list-style-type: none"> <li>Pull the screw fitting and seal with strain relief 31 mm over the cable.</li> </ul>                                                                                                                                            |
| 2 |    | <ul style="list-style-type: none"> <li>Strip 28 mm of cable insulation off the end of the cable</li> </ul>                                                                                                                                                            |
| 3 |   | <ul style="list-style-type: none"> <li>Fold back the braided shield and fan it out</li> </ul>                                                                                                                                                                         |
| 4 |  | <ul style="list-style-type: none"> <li>Strip 6 mm of cable insulation off the lead</li> <li>Push the socket contacts onto the ends of the leads</li> </ul>                                                                                                            |
| 5 |  | <ul style="list-style-type: none"> <li>Insert the small-diameter positioning tool (SEW part number 019 244 9) into the crimping tool until the green mark appears in the view window [A].</li> <li>Set the press thickness [B] to 24 on the crimping tool.</li> </ul> |
| 6 |  | <ul style="list-style-type: none"> <li>Insert a lead with socket contact in the crimping tool and press the tool fully together. The tool then opens automatically.</li> <li>Repeat this procedure for each lead</li> </ul>                                           |
| 7 |  | <ul style="list-style-type: none"> <li>Pull the shield ring over the leads and press the shield against the seal</li> </ul>                                                                                                                                           |



## Appendix

### HIPERFACE® resolver signal plug connector assembly

|    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8  |  | <ul style="list-style-type: none"> <li>Turn the shield ring until the braided shield is flush with the shield ring</li> </ul>                                                                                                                                                                                                                                                                                                                                        |
| 9  |  | <ul style="list-style-type: none"> <li>Pull the insulator apart evenly by about 1 mm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                      |
| 10 |  | <ul style="list-style-type: none"> <li>Insert the socket contacts into the insulator</li> </ul>                                                                                                                                                                                                                                                                                                                                                                      |
| 11 |  | <ul style="list-style-type: none"> <li>Press the insulator together until you hear a "click"</li> </ul>                                                                                                                                                                                                                                                                                                                                                              |
| 12 |  | <ul style="list-style-type: none"> <li>Fold open the insulating sleeve.</li> <li>Position the side of the insulating sleeve with the recess against the groove in the insulator so that the opening of the insulating sleeve is pointing in the same direction as the double-headed arrow on the insulator</li> <li>Press the insulating sleeve together until it engages</li> <li>Insert the insulator into the connector housing in the middle position</li> </ul> |
| 13 |  | <ul style="list-style-type: none"> <li>Use a wrench to hold the connector housing in place and use a second wrench to tighten the screw fitting</li> <li>[A] = Fix in place</li> </ul>                                                                                                                                                                                                                                                                               |



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## Address List

| Germany                                                          |                                         |                                                                                                                           |                                                                                                                                                                                       |
|------------------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Headquarters<br>Production<br>Sales                              | Bruchsal                                | SEW-EURODRIVE GmbH & Co KG<br>Ernst-Blickle-Straße 42<br>D-76646 Bruchsal<br>P.O. Box<br>Postfach 3023 • D-76642 Bruchsal | Tel. +49 7251 75-0<br>Fax +49 7251 75-1970<br><a href="http://www.sew-eurodrive.de">http://www.sew-eurodrive.de</a><br><a href="mailto:sew@sew-eurodrive.de">sew@sew-eurodrive.de</a> |
| Service<br>Competence Center                                     | Central                                 | SEW-EURODRIVE GmbH & Co KG<br>Ernst-Blickle-Straße 1<br>D-76676 Graben-Neudorf                                            | Tel. +49 7251 75-1710<br>Fax +49 7251 75-1711<br><a href="mailto:sc-mitte@sew-eurodrive.de">sc-mitte@sew-eurodrive.de</a>                                                             |
|                                                                  | North                                   | SEW-EURODRIVE GmbH & Co KG<br>Alte Ricklinger Straße 40-42<br>D-30823 Garbsen (near Hannover)                             | Tel. +49 5137 8798-30<br>Fax +49 5137 8798-55<br><a href="mailto:sc-nord@sew-eurodrive.de">sc-nord@sew-eurodrive.de</a>                                                               |
|                                                                  | East                                    | SEW-EURODRIVE GmbH & Co KG<br>Dänkritzter Weg 1<br>D-08393 Meerane (near Zwickau)                                         | Tel. +49 3764 7606-0<br>Fax +49 3764 7606-30<br><a href="mailto:sc-ost@sew-eurodrive.de">sc-ost@sew-eurodrive.de</a>                                                                  |
|                                                                  | South                                   | SEW-EURODRIVE GmbH & Co KG<br>Domagkstraße 5<br>D-85551 Kirchheim (near München)                                          | Tel. +49 89 909552-10<br>Fax +49 89 909552-50<br><a href="mailto:sc-sued@sew-eurodrive.de">sc-sued@sew-eurodrive.de</a>                                                               |
|                                                                  | West                                    | SEW-EURODRIVE GmbH & Co KG<br>Siemensstraße 1<br>D-40764 Langenfeld (near Düsseldorf)                                     | Tel. +49 2173 8507-30<br>Fax +49 2173 8507-55<br><a href="mailto:sc-west@sew-eurodrive.de">sc-west@sew-eurodrive.de</a>                                                               |
|                                                                  | Electronics                             | SEW-EURODRIVE GmbH & Co KG<br>Ernst-Blickle-Straße 42<br>D-76646 Bruchsal                                                 | Tel. +49 7251 75-1780<br>Fax +49 7251 75-1769<br><a href="mailto:sc-elektronik@sew-eurodrive.de">sc-elektronik@sew-eurodrive.de</a>                                                   |
|                                                                  | Drive Service Hotline / 24 Hour Service |                                                                                                                           | +49 180 5 SEWHELP<br>+49 180 5 7394357                                                                                                                                                |
| Additional addresses for service in Germany provided on request! |                                         |                                                                                                                           |                                                                                                                                                                                       |
| France                                                           |                                         |                                                                                                                           |                                                                                                                                                                                       |
| Production<br>Sales<br>Service                                   | Hagenau                                 | SEW-USOCOME<br>48-54, route de Soufflenheim<br>B. P. 20185<br>F-67506 Hagenau Cedex                                       | Tel. +33 3 88 73 67 00<br>Fax +33 3 88 73 66 00<br><a href="http://www.usocom.com">http://www.usocom.com</a><br><a href="mailto:sew@usocom.com">sew@usocom.com</a>                    |
| Production                                                       | Forbach                                 | SEW-EUROCOME<br>Zone Industrielle<br>Technopôle Forbach Sud<br>B. P. 30269<br>F-57604 Forbach Cedex                       | Tel. +33 3 87 29 38 00                                                                                                                                                                |
| Assembly<br>Sales<br>Service                                     | Bordeaux                                | SEW-USOCOME<br>Parc d'activités de Magellan<br>62, avenue de Magellan - B. P. 182<br>F-33607 Pessac Cedex                 | Tel. +33 5 57 26 39 00<br>Fax +33 5 57 26 39 09                                                                                                                                       |
|                                                                  | Lyon                                    | SEW-USOCOME<br>Parc d'Affaires Roosevelt<br>Rue Jacques Tati<br>F-69120 Vaulx en Velin                                    | Tel. +33 4 72 15 37 00<br>Fax +33 4 72 15 37 15                                                                                                                                       |
|                                                                  | Paris                                   | SEW-USOCOME<br>Zone industrielle<br>2, rue Denis Papin<br>F-77390 Verneuil l'Etang                                        | Tel. +33 1 64 42 40 80<br>Fax +33 1 64 42 40 88                                                                                                                                       |
| Additional addresses for service in France provided on request!  |                                         |                                                                                                                           |                                                                                                                                                                                       |



## Address List

|                                                                 |                         |                                                                                                                                                                  |                                                                                                                                                               |
|-----------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Algeria</b>                                                  |                         |                                                                                                                                                                  |                                                                                                                                                               |
| <b>Sales</b>                                                    | <b>Alger</b>            | Réducom<br>16, rue des Frères Zagnoun<br>Bellevue El-Harrach<br>16200 Alger                                                                                      | Tel. +213 21 8222-84<br>Fax +213 21 8222-84<br>reducom_sew@yahoo.fr                                                                                           |
| <b>Argentina</b>                                                |                         |                                                                                                                                                                  |                                                                                                                                                               |
| <b>Assembly<br/>Sales<br/>Service</b>                           | <b>Buenos Aires</b>     | SEW EURODRIVE ARGENTINA S.A.<br>Centro Industrial Garin, Lote 35<br>Ruta Panamericana Km 37,5<br>1619 Garin                                                      | Tel. +54 3327 4572-84<br>Fax +54 3327 4572-21<br>sewar@sew-eurodrive.com.ar<br><a href="http://www.sew-eurodrive.com.ar">http://www.sew-eurodrive.com.ar</a>  |
| <b>Australia</b>                                                |                         |                                                                                                                                                                  |                                                                                                                                                               |
| <b>Assembly<br/>Sales<br/>Service</b>                           | <b>Melbourne</b>        | SEW-EURODRIVE PTY. LTD.<br>27 Beverage Drive<br>Tullamarine, Victoria 3043                                                                                       | Tel. +61 3 9933-1000<br>Fax +61 3 9933-1003<br><a href="http://www.sew-eurodrive.com.au">http://www.sew-eurodrive.com.au</a><br>enquires@sew-eurodrive.com.au |
|                                                                 | <b>Sydney</b>           | SEW-EURODRIVE PTY. LTD.<br>9, Sleigh Place, Wetherill Park<br>New South Wales, 2164                                                                              | Tel. +61 2 9725-9900<br>Fax +61 2 9725-9905<br>enquires@sew-eurodrive.com.au                                                                                  |
| <b>Austria</b>                                                  |                         |                                                                                                                                                                  |                                                                                                                                                               |
| <b>Assembly<br/>Sales<br/>Service</b>                           | <b>Wien</b>             | SEW-EURODRIVE Ges.m.b.H.<br>Richard-Strauss-Strasse 24<br>A-1230 Wien                                                                                            | Tel. +43 1 617 55 00-0<br>Fax +43 1 617 55 00-30<br><a href="http://sew-eurodrive.at">http://sew-eurodrive.at</a><br>sew@sew-eurodrive.at                     |
| <b>Belarus</b>                                                  |                         |                                                                                                                                                                  |                                                                                                                                                               |
| <b>Sales</b>                                                    | <b>Minsk</b>            | SEW-EURODRIVE BY<br>Rybalko Str. 26<br>BY-220033 Minsk                                                                                                           | Tel. +375 (17) 298 38 50<br>Fax +375 (17) 29838 50<br>sales@sew.by                                                                                            |
| <b>Belgium</b>                                                  |                         |                                                                                                                                                                  |                                                                                                                                                               |
| <b>Assembly<br/>Sales<br/>Service</b>                           | <b>Brüssel</b>          | SEW Caron-Vector S.A.<br>Avenue Eiffel 5<br>B-1300 Wavre                                                                                                         | Tel. +32 10 231-311<br>Fax +32 10 231-336<br><a href="http://www.sew-eurodrive.be">http://www.sew-eurodrive.be</a><br>info@caron-vector.be                    |
| <b>Service<br/>Competence Center</b>                            | <b>Industrial Gears</b> | SEW Caron-Vector S.A.<br>Rue de Parc Industriel, 31<br>BE-6900 Marche-en-Famenne                                                                                 | Tel. +32 84 219-878<br>Fax +32 84 219-879<br><a href="http://www.sew-eurodrive.be">http://www.sew-eurodrive.be</a><br>service-wallonie@sew-eurodrive.be       |
| <b>Brazil</b>                                                   |                         |                                                                                                                                                                  |                                                                                                                                                               |
| <b>Production<br/>Sales<br/>Service</b>                         | <b>Sao Paulo</b>        | SEW-EURODRIVE Brasil Ltda.<br>Avenida Amâncio Gaiolli, 152 - Rodovia<br>Presidente Dutra Km 208<br>Guarulhos - 07251-250 - SP<br>SAT - SEW ATENDE - 0800 7700496 | Tel. +55 11 6489-9133<br>Fax +55 11 6480-3328<br><a href="http://www.sew-eurodrive.com.br">http://www.sew-eurodrive.com.br</a><br>sew@sew.com.br              |
| Additional addresses for service in Brazil provided on request! |                         |                                                                                                                                                                  |                                                                                                                                                               |
| <b>Bulgaria</b>                                                 |                         |                                                                                                                                                                  |                                                                                                                                                               |
| <b>Sales</b>                                                    | <b>Sofia</b>            | BEVER-DRIVE GmbH<br>Bogdanovetz Str.1<br>BG-1606 Sofia                                                                                                           | Tel. +359 2 9151160<br>Fax +359 2 9151166<br>bever@fastbg.net                                                                                                 |
| <b>Cameroon</b>                                                 |                         |                                                                                                                                                                  |                                                                                                                                                               |
| <b>Sales</b>                                                    | <b>Douala</b>           | Electro-Services<br>Rue Drouot Akwa<br>B.P. 2024<br>Douala                                                                                                       | Tel. +237 33 431137<br>Fax +237 33 431137                                                                                                                     |



| Canada                                                         |                                                                 |                                                                                                                                                                                |                                                                                                                                                                                                            |
|----------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Assembly<br>Sales<br>Service                                   | Toronto                                                         | SEW-EURODRIVE CO. OF CANADA LTD.<br>210 Walker Drive<br>Bramalea, Ontario L6T3W1                                                                                               | Tel. +1 905 791-1553<br>Fax +1 905 791-2999<br><a href="http://www.sew-eurodrive.ca">http://www.sew-eurodrive.ca</a><br><a href="mailto:marketing@sew-eurodrive.ca">marketing@sew-eurodrive.ca</a>         |
|                                                                | Vancouver                                                       | SEW-EURODRIVE CO. OF CANADA LTD.<br>7188 Honeyman Street<br>Delta. B.C. V4G 1 E2                                                                                               | Tel. +1 604 946-5535<br>Fax +1 604 946-2513<br><a href="mailto:marketing@sew-eurodrive.ca">marketing@sew-eurodrive.ca</a>                                                                                  |
|                                                                | Montreal                                                        | SEW-EURODRIVE CO. OF CANADA LTD.<br>2555 Rue Leger<br>LaSalle, Quebec H8N 2V9                                                                                                  | Tel. +1 514 367-1124<br>Fax +1 514 367-3677<br><a href="mailto:marketing@sew-eurodrive.ca">marketing@sew-eurodrive.ca</a>                                                                                  |
|                                                                | Additional addresses for service in Canada provided on request! |                                                                                                                                                                                |                                                                                                                                                                                                            |
|                                                                |                                                                 |                                                                                                                                                                                |                                                                                                                                                                                                            |
| Chile                                                          |                                                                 |                                                                                                                                                                                |                                                                                                                                                                                                            |
| Assembly<br>Sales<br>Service                                   | Santiago de Chile                                               | SEW-EURODRIVE CHILE LTDA.<br>Las Encinas 1295<br>Parque Industrial Valle Grande<br>LAMP<br>RCH-Santiago de Chile<br>P.O. Box<br>Casilla 23 Correo Quilicura - Santiago - Chile | Tel. +56 2 75770-00<br>Fax +56 2 75770-01<br><a href="http://www.sew-eurodrive.cl">http://www.sew-eurodrive.cl</a><br><a href="mailto:ventas@sew-eurodrive.cl">ventas@sew-eurodrive.cl</a>                 |
| China                                                          |                                                                 |                                                                                                                                                                                |                                                                                                                                                                                                            |
| Production<br>Assembly<br>Sales<br>Service                     | Tianjin                                                         | SEW-EURODRIVE (Tianjin) Co., Ltd.<br>No. 46, 7th Avenue, TEDA<br>Tianjin 300457                                                                                                | Tel. +86 22 25322612<br>Fax +86 22 25322611<br><a href="mailto:info@sew-eurodrive.cn">info@sew-eurodrive.cn</a><br><a href="http://www.sew-eurodrive.cn">http://www.sew-eurodrive.cn</a>                   |
| Assembly<br>Sales<br>Service                                   | Suzhou                                                          | SEW-EURODRIVE (Suzhou) Co., Ltd.<br>333, Suhong Middle Road<br>Suzhou Industrial Park<br>Jiangsu Province, 215021                                                              | Tel. +86 512 62581781<br>Fax +86 512 62581783<br><a href="mailto:suzhou@sew-eurodrive.cn">suzhou@sew-eurodrive.cn</a>                                                                                      |
|                                                                | Guangzhou                                                       | SEW-EURODRIVE (Guangzhou) Co., Ltd.<br>No. 9, JunDa Road<br>East Section of GETDD<br>Guangzhou 510530                                                                          | Tel. +86 20 82267890<br>Fax +86 20 82267891<br><a href="mailto:guangzhou@sew-eurodrive.cn">guangzhou@sew-eurodrive.cn</a>                                                                                  |
|                                                                | Shenyang                                                        | SEW-EURODRIVE (Shenyang) Co., Ltd.<br>10A-2, 6th Road<br>Shenyang Economic Technological<br>Development Area<br>Shenyang, 110141                                               | Tel. +86 24 25382538<br>Fax +86 24 25382580<br><a href="mailto:shenyang@sew-eurodrive.cn">shenyang@sew-eurodrive.cn</a>                                                                                    |
|                                                                | Wuhan                                                           | SEW-EURODRIVE (Wuhan) Co., Ltd.<br>10A-2, 6th Road<br>No. 59, the 4th Quanli Road, WEDA<br>430056 Wuhan                                                                        | Tel. +86 27 84478398<br>Fax +86 27 84478388                                                                                                                                                                |
| Additional addresses for service in China provided on request! |                                                                 |                                                                                                                                                                                |                                                                                                                                                                                                            |
| Colombia                                                       |                                                                 |                                                                                                                                                                                |                                                                                                                                                                                                            |
| Assembly<br>Sales<br>Service                                   | Bogotá                                                          | SEW-EURODRIVE COLOMBIA LTDA.<br>Calle 22 No. 132-60<br>Bodega 6, Manzana B<br>Santafé de Bogotá                                                                                | Tel. +57 1 54750-50<br>Fax +57 1 54750-44<br><a href="http://www.sew-eurodrive.com.co">http://www.sew-eurodrive.com.co</a><br><a href="mailto:sewcol@sew-eurodrive.com.co">sewcol@sew-eurodrive.com.co</a> |
| Croatia                                                        |                                                                 |                                                                                                                                                                                |                                                                                                                                                                                                            |
| Sales<br>Service                                               | Zagreb                                                          | KOMPEKS d. o. o.<br>PIT Erdödy 4 II<br>HR 10 000 Zagreb                                                                                                                        | Tel. +385 1 4613-158<br>Fax +385 1 4613-158<br><a href="mailto:kompeks@inet.hr">kompeks@inet.hr</a>                                                                                                        |



## Address List

| Czech Republic                             |                   |                                                                                                                                    |                                                                                                                                                                                                        |
|--------------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sales</b>                               | <b>Praha</b>      | SEW-EURODRIVE CZ S.R.O.<br>Business Centrum Praha<br>Lužná 591<br>CZ-16000 Praha 6 - Vokovice                                      | Tel. +420 255 709 601<br>Fax +420 220 121 237<br><a href="http://www.sew-eurodrive.cz">http://www.sew-eurodrive.cz</a><br><a href="mailto:sew@sew-eurodrive.cz">sew@sew-eurodrive.cz</a>               |
| Denmark                                    |                   |                                                                                                                                    |                                                                                                                                                                                                        |
| <b>Assembly<br/>Sales<br/>Service</b>      | <b>Kopenhagen</b> | SEW-EURODRIVE A/S<br>Geminivej 28-30<br>DK-2670 Greve                                                                              | Tel. +45 43 9585-00<br>Fax +45 43 9585-09<br><a href="http://www.sew-eurodrive.dk">http://www.sew-eurodrive.dk</a><br><a href="mailto:sew@sew-eurodrive.dk">sew@sew-eurodrive.dk</a>                   |
| Egypt                                      |                   |                                                                                                                                    |                                                                                                                                                                                                        |
| <b>Sales<br/>Service</b>                   | <b>Cairo</b>      | Copam Egypt<br>for Engineering & Agencies<br>33 El Hegaz ST, Heliopolis, Cairo                                                     | Tel. +20 2 22566-299 + 1 23143088<br>Fax +20 2 22594-757<br><a href="http://www.copam-egypt.com/">http://www.copam-egypt.com/</a><br><a href="mailto:copam@datum.com.eg">copam@datum.com.eg</a>        |
| Estonia                                    |                   |                                                                                                                                    |                                                                                                                                                                                                        |
| <b>Sales</b>                               | <b>Tallin</b>     | ALAS-KUUL AS<br>Reti tee 4<br>EE-75301 Peetri küla, Rae vald, Harjumaa                                                             | Tel. +372 6593230<br>Fax +372 6593231<br><a href="mailto:veiko.soots@alas-kuul.ee">veiko.soots@alas-kuul.ee</a>                                                                                        |
| Finland                                    |                   |                                                                                                                                    |                                                                                                                                                                                                        |
| <b>Assembly<br/>Sales<br/>Service</b>      | <b>Lahti</b>      | SEW-EURODRIVE OY<br>Vesimäentie 4<br>FIN-15860 Hollola 2                                                                           | Tel. +358 201 589-300<br>Fax +358 3 780-6211<br><a href="mailto:sew@sew.fi">sew@sew.fi</a><br><a href="http://www.sew-eurodrive.fi">http://www.sew-eurodrive.fi</a>                                    |
| <b>Production<br/>Assembly<br/>Service</b> | <b>Karkkila</b>   | SEW Industrial Gears OY<br>Valurinkatu 6<br>FIN-03600 Karkkila                                                                     | Tel. +358 201 589-300<br>Fax +358 201 589-310<br><a href="mailto:sew@sew.fi">sew@sew.fi</a><br><a href="http://www.sew-eurodrive.fi">http://www.sew-eurodrive.fi</a>                                   |
| Gabon                                      |                   |                                                                                                                                    |                                                                                                                                                                                                        |
| <b>Sales</b>                               | <b>Libreville</b> | Electro-Services<br>B.P. 1889<br>Libreville                                                                                        | Tel. +241 7340-11<br>Fax +241 7340-12                                                                                                                                                                  |
| Great Britain                              |                   |                                                                                                                                    |                                                                                                                                                                                                        |
| <b>Assembly<br/>Sales<br/>Service</b>      | <b>Normanton</b>  | SEW-EURODRIVE Ltd.<br>Beckbridge Industrial Estate<br>P.O. Box No.1<br>GB-Normanton, West- Yorkshire WF6 1QR                       | Tel. +44 1924 893-855<br>Fax +44 1924 893-702<br><a href="http://www.sew-eurodrive.co.uk">http://www.sew-eurodrive.co.uk</a><br><a href="mailto:info@sew-eurodrive.co.uk">info@sew-eurodrive.co.uk</a> |
| Greece                                     |                   |                                                                                                                                    |                                                                                                                                                                                                        |
| <b>Sales<br/>Service</b>                   | <b>Athen</b>      | Christ. Boznos & Son S.A.<br>12, Mavromichali Street<br>P.O. Box 80136, GR-18545 Piraeus                                           | Tel. +30 2 1042 251-34<br>Fax +30 2 1042 251-59<br><a href="http://www.boznos.gr">http://www.boznos.gr</a><br><a href="mailto:info@boznos.gr">info@boznos.gr</a>                                       |
| Hong Kong                                  |                   |                                                                                                                                    |                                                                                                                                                                                                        |
| <b>Assembly<br/>Sales<br/>Service</b>      | <b>Hong Kong</b>  | SEW-EURODRIVE LTD.<br>Unit No. 801-806, 8th Floor<br>Hong Leong Industrial Complex<br>No. 4, Wang Kwong Road<br>Kowloon, Hong Kong | Tel. +852 36902200<br>Fax +852 36902211<br><a href="mailto:contact@sew-eurodrive.hk">contact@sew-eurodrive.hk</a>                                                                                      |



|                               |                   |                                                                                                              |                                                                                                                                                      |
|-------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Hungary</b>                |                   |                                                                                                              |                                                                                                                                                      |
| <b>Sales Service</b>          | <b>Budapest</b>   | SEW-EURODRIVE Kft.<br>H-1037 Budapest<br>Kunigunda u. 18                                                     | Tel. +36 1 437 06-58<br>Fax +36 1 437 06-50<br>office@sew-eurodrive.hu                                                                               |
| <b>India</b>                  |                   |                                                                                                              |                                                                                                                                                      |
| <b>Assembly Sales Service</b> | <b>Vadodara</b>   | SEW-EURODRIVE India Private Limited<br>Plot No. 4, GIDC<br>POR Ramangamdi • Vadodara - 391 243<br>Gujarat    | Tel. +91 265 2831086<br>Fax +91 265 2831087<br>http://www.seweurodriveindia.com<br>sales@seweurodriveindia.com<br>subodh.ladwa@seweurodriveindia.com |
| <b>Ireland</b>                |                   |                                                                                                              |                                                                                                                                                      |
| <b>Sales Service</b>          | <b>Dublin</b>     | Alpertons Engineering Ltd.<br>48 Moyle Road<br>Dublin Industrial Estate<br>Glasnevin, Dublin 11              | Tel. +353 1 830-6277<br>Fax +353 1 830-6458<br>info@alpertons.ie<br>http://www.alpertons.ie                                                          |
| <b>Israel</b>                 |                   |                                                                                                              |                                                                                                                                                      |
| <b>Sales</b>                  | <b>Tel-Aviv</b>   | Liraz Handasa Ltd.<br>Ahofer Str 34B / 228<br>58858 Holon                                                    | Tel. +972 3 5599511<br>Fax +972 3 5599512<br>http://www.liraz-handasa.co.il<br>office@liraz-handasa.co.il                                            |
| <b>Italy</b>                  |                   |                                                                                                              |                                                                                                                                                      |
| <b>Assembly Sales Service</b> | <b>Milano</b>     | SEW-EURODRIVE di R. Blicke & Co.s.a.s.<br>Via Bernini,14<br>I-20020 Solaro (Milano)                          | Tel. +39 02 96 9801<br>Fax +39 02 96 799781<br>http://www.sew-eurodrive.it<br>sewit@sew-eurodrive.it                                                 |
| <b>Ivory Coast</b>            |                   |                                                                                                              |                                                                                                                                                      |
| <b>Sales</b>                  | <b>Abidjan</b>    | SICA<br>Ste industrielle et commerciale pour l'Afrique<br>165, Bld de Marseille<br>B.P. 2323, Abidjan 08     | Tel. +225 2579-44<br>Fax +225 2584-36                                                                                                                |
| <b>Japan</b>                  |                   |                                                                                                              |                                                                                                                                                      |
| <b>Assembly Sales Service</b> | <b>Iwata</b>      | SEW-EURODRIVE JAPAN CO., LTD<br>250-1, Shimoman-no,<br>Iwata<br>Shizuoka 438-0818                            | Tel. +81 538 373811<br>Fax +81 538 373814<br>http://www.sew-eurodrive.co.jp<br>sewjapan@sew-eurodrive.co.jp                                          |
| <b>Korea</b>                  |                   |                                                                                                              |                                                                                                                                                      |
| <b>Assembly Sales Service</b> | <b>Ansan-City</b> | SEW-EURODRIVE KOREA CO., LTD.<br>B 601-4, Banweol Industrial Estate<br>1048-4, Shingil-Dong<br>Ansan 425-120 | Tel. +82 31 492-8051<br>Fax +82 31 492-8056<br>http://www.sew-korea.co.kr<br>master@sew-korea.co.kr                                                  |
|                               | <b>Busan</b>      | SEW-EURODRIVE KOREA Co., Ltd.<br>No. 1720 - 11, Songjeong - dong<br>Gangseo-ku<br>Busan 618-270              | Tel. +82 51 832-0204<br>Fax +82 51 832-0230<br>master@sew-korea.co.kr                                                                                |
| <b>Latvia</b>                 |                   |                                                                                                              |                                                                                                                                                      |
| <b>Sales</b>                  | <b>Riga</b>       | SIA Alas-Kuul<br>Katlakalna 11C<br>LV-1073 Riga                                                              | Tel. +371 7139253<br>Fax +371 7139386<br>http://www.alas-kuul.com<br>info@alas-kuul.com                                                              |



## Address List

| Lebanon                                           |                     |                                                                                                                                            |                                                                                                                                                                |
|---------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sales</b>                                      | <b>Beirut</b>       | Gabriel Acar & Fils sarl<br>B. P. 80484<br>Bourj Hammoud, Beirut                                                                           | Tel. +961 1 4947-86<br>+961 1 4982-72<br>+961 3 2745-39<br>Fax +961 1 4949-71<br>gacar@beirut.com                                                              |
| Lithuania                                         |                     |                                                                                                                                            |                                                                                                                                                                |
| <b>Sales</b>                                      | <b>Alytus</b>       | UAB Irseva<br>Naujoji 19<br>LT-62175 Alytus                                                                                                | Tel. +370 315 79204<br>Fax +370 315 56175<br>info@irseva.lt<br><a href="http://www.sew-eurodrive.lt">http://www.sew-eurodrive.lt</a>                           |
| Luxembourg                                        |                     |                                                                                                                                            |                                                                                                                                                                |
| <b>Assembly</b><br><b>Sales</b><br><b>Service</b> | <b>Brüssel</b>      | CARON-VECTOR S.A.<br>Avenue Eiffel 5<br>B-1300 Wavre                                                                                       | Tel. +32 10 231-311<br>Fax +32 10 231-336<br><a href="http://www.sew-eurodrive.lu">http://www.sew-eurodrive.lu</a><br>info@caron-vector.be                     |
| Malaysia                                          |                     |                                                                                                                                            |                                                                                                                                                                |
| <b>Assembly</b><br><b>Sales</b><br><b>Service</b> | <b>Johore</b>       | SEW-EURODRIVE SDN BHD<br>No. 95, Jalan Seroja 39, Taman Johor Jaya<br>81000 Johor Bahru, Johor<br>West Malaysia                            | Tel. +60 7 3549409<br>Fax +60 7 3541404<br>sales@sew-eurodrive.com.my                                                                                          |
| Mexico                                            |                     |                                                                                                                                            |                                                                                                                                                                |
| <b>Assembly</b><br><b>Sales</b><br><b>Service</b> | <b>Queretaro</b>    | SEW-EURODRIVE MEXIKO SA DE CV<br>SEM-981118-M93<br>Tequisquiapan No. 102<br>Parque Industrial Queretaro<br>C.P. 76220<br>Queretaro, Mexico | Tel. +52 442 1030-300<br>Fax +52 442 1030-301<br><a href="http://www.sew-eurodrive.com.mx">http://www.sew-eurodrive.com.mx</a><br>scmexico@seweurodrive.com.mx |
| Morocco                                           |                     |                                                                                                                                            |                                                                                                                                                                |
| <b>Sales</b>                                      | <b>Casablanca</b>   | Afit<br>5, rue Emir Abdelkader<br>MA 20300 Casablanca                                                                                      | Tel. +212 22618372<br>Fax +212 22618351<br>ali.alami@premium.net.ma                                                                                            |
| Netherlands                                       |                     |                                                                                                                                            |                                                                                                                                                                |
| <b>Assembly</b><br><b>Sales</b><br><b>Service</b> | <b>Rotterdam</b>    | VECTOR Aandrijftechniek B.V.<br>Industrieweg 175<br>NL-3044 AS Rotterdam<br>Postbus 10085<br>NL-3004 AB Rotterdam                          | Tel. +31 10 4463-700<br>Fax +31 10 4155-552<br><a href="http://www.vector.nu">http://www.vector.nu</a><br>info@vector.nu                                       |
| New Zealand                                       |                     |                                                                                                                                            |                                                                                                                                                                |
| <b>Assembly</b><br><b>Sales</b><br><b>Service</b> | <b>Auckland</b>     | SEW-EURODRIVE NEW ZEALAND LTD.<br>P.O. Box 58-428<br>82 Greenmount drive<br>East Tamaki Auckland                                           | Tel. +64 9 2745627<br>Fax +64 9 2740165<br><a href="http://www.sew-eurodrive.co.nz">http://www.sew-eurodrive.co.nz</a><br>sales@sew-eurodrive.co.nz            |
|                                                   | <b>Christchurch</b> | SEW-EURODRIVE NEW ZEALAND LTD.<br>10 Settlers Crescent, Ferrymead<br>Christchurch                                                          | Tel. +64 3 384-6251<br>Fax +64 3 384-6455<br>sales@sew-eurodrive.co.nz                                                                                         |
| Norway                                            |                     |                                                                                                                                            |                                                                                                                                                                |
| <b>Assembly</b><br><b>Sales</b><br><b>Service</b> | <b>Moss</b>         | SEW-EURODRIVE A/S<br>Solgaard skog 71<br>N-1599 Moss                                                                                       | Tel. +47 69 24 10 20<br>Fax +47 69 24 10 40<br><a href="http://www.sew-eurodrive.no">http://www.sew-eurodrive.no</a><br>sew@sew-eurodrive.no                   |



|                                       |                       |                                                                                                               |                                                                                                                                                                                                              |
|---------------------------------------|-----------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Peru</b>                           |                       |                                                                                                               |                                                                                                                                                                                                              |
| <b>Assembly<br/>Sales<br/>Service</b> | <b>Lima</b>           | SEW DEL PERU MOTORES REDUCTORES S.A.C.<br>Los Calderos, 120-124<br>Urbanizacion Industrial Vulcano, ATE, Lima | Tel. +51 1 3495280<br>Fax +51 1 3493002<br><a href="http://www.sew-eurodrive.com.pe">http://www.sew-eurodrive.com.pe</a><br><a href="mailto:sewperu@sew-eurodrive.com.pe">sewperu@sew-eurodrive.com.pe</a>   |
| <b>Poland</b>                         |                       |                                                                                                               |                                                                                                                                                                                                              |
| <b>Assembly<br/>Sales<br/>Service</b> | <b>Lodz</b>           | SEW-EURODRIVE Polska Sp.z.o.o.<br>ul. Techniczna 5<br>PL-92-518 Łódź                                          | Tel. +48 42 67710-90<br>Fax +48 42 67710-99<br><a href="http://www.sew-eurodrive.pl">http://www.sew-eurodrive.pl</a><br><a href="mailto:sew@sew-eurodrive.pl">sew@sew-eurodrive.pl</a>                       |
|                                       |                       | <b>24 Hour Service</b>                                                                                        | Tel. +48 602 739 739<br>(+48 602 SEW SEW)<br><a href="mailto:sewis@sew-eurodrive.pl">sewis@sew-eurodrive.pl</a>                                                                                              |
| <b>Portugal</b>                       |                       |                                                                                                               |                                                                                                                                                                                                              |
| <b>Assembly<br/>Sales<br/>Service</b> | <b>Coimbra</b>        | SEW-EURODRIVE, LDA.<br>Apartado 15<br>P-3050-901 Mealhada                                                     | Tel. +351 231 20 9670<br>Fax +351 231 20 3685<br><a href="http://www.sew-eurodrive.pt">http://www.sew-eurodrive.pt</a><br><a href="mailto:infosew@sew-eurodrive.pt">infosew@sew-eurodrive.pt</a>             |
| <b>Romania</b>                        |                       |                                                                                                               |                                                                                                                                                                                                              |
| <b>Sales<br/>Service</b>              | <b>București</b>      | Sialco Trading SRL<br>str. Madrid nr.4<br>011785 Bucuresti                                                    | Tel. +40 21 230-1328<br>Fax +40 21 230-7170<br><a href="mailto:sialco@sialco.ro">sialco@sialco.ro</a>                                                                                                        |
| <b>Russia</b>                         |                       |                                                                                                               |                                                                                                                                                                                                              |
| <b>Assembly<br/>Sales<br/>Service</b> | <b>St. Petersburg</b> | ZAO SEW-EURODRIVE<br>P.O. Box 36<br>195220 St. Petersburg Russia                                              | Tel. +7 812 3332522 +7 812 5357142<br>Fax +7 812 3332523<br><a href="http://www.sew-eurodrive.ru">http://www.sew-eurodrive.ru</a><br><a href="mailto:sew@sew-eurodrive.ru">sew@sew-eurodrive.ru</a>          |
| <b>Senegal</b>                        |                       |                                                                                                               |                                                                                                                                                                                                              |
| <b>Sales</b>                          | <b>Dakar</b>          | SENEMECA<br>Mécanique Générale<br>Km 8, Route de Rufisque<br>B.P. 3251, Dakar                                 | Tel. +221 338 494 770<br>Fax +221 338 494 771<br><a href="mailto:senemeca@sentoo.sn">senemeca@sentoo.sn</a>                                                                                                  |
| <b>Serbia</b>                         |                       |                                                                                                               |                                                                                                                                                                                                              |
| <b>Sales</b>                          | <b>Beograd</b>        | DIPAR d.o.o.<br>Ustanicka 128a<br>PC Košum, IV floor<br>SCG-11000 Beograd                                     | Tel. +381 11 347 3244 / +381 11 288 0393<br>Fax +381 11 347 1337<br><a href="mailto:office@dipar.co.yu">office@dipar.co.yu</a>                                                                               |
| <b>Singapore</b>                      |                       |                                                                                                               |                                                                                                                                                                                                              |
| <b>Assembly<br/>Sales<br/>Service</b> | <b>Singapore</b>      | SEW-EURODRIVE PTE. LTD.<br>No 9, Tuas Drive 2<br>Jurong Industrial Estate<br>Singapore 638644                 | Tel. +65 68621701<br>Fax +65 68612827<br><a href="http://www.sew-eurodrive.com.sg">http://www.sew-eurodrive.com.sg</a><br><a href="mailto:sewsingapore@sew-eurodrive.com">sewsingapore@sew-eurodrive.com</a> |
| <b>Slovakia</b>                       |                       |                                                                                                               |                                                                                                                                                                                                              |
| <b>Sales</b>                          | <b>Bratislava</b>     | SEW-Eurodrive SK s.r.o.<br>Rybničná 40<br>SK-831 06 Bratislava                                                | Tel. +421 2 33595 202<br>Fax +421 2 33595 200<br><a href="mailto:sew@sew-eurodrive.sk">sew@sew-eurodrive.sk</a><br><a href="http://www.sew-eurodrive.sk">http://www.sew-eurodrive.sk</a>                     |
|                                       | <b>Žilina</b>         | SEW-Eurodrive SK s.r.o.<br>Industry Park – PChZ<br>ulica M.R.Štefánika 71<br>SK-010 01 Žilina                 | Tel. +421 41 700 2513<br>Fax +421 41 700 2514<br><a href="mailto:sew@sew-eurodrive.sk">sew@sew-eurodrive.sk</a>                                                                                              |



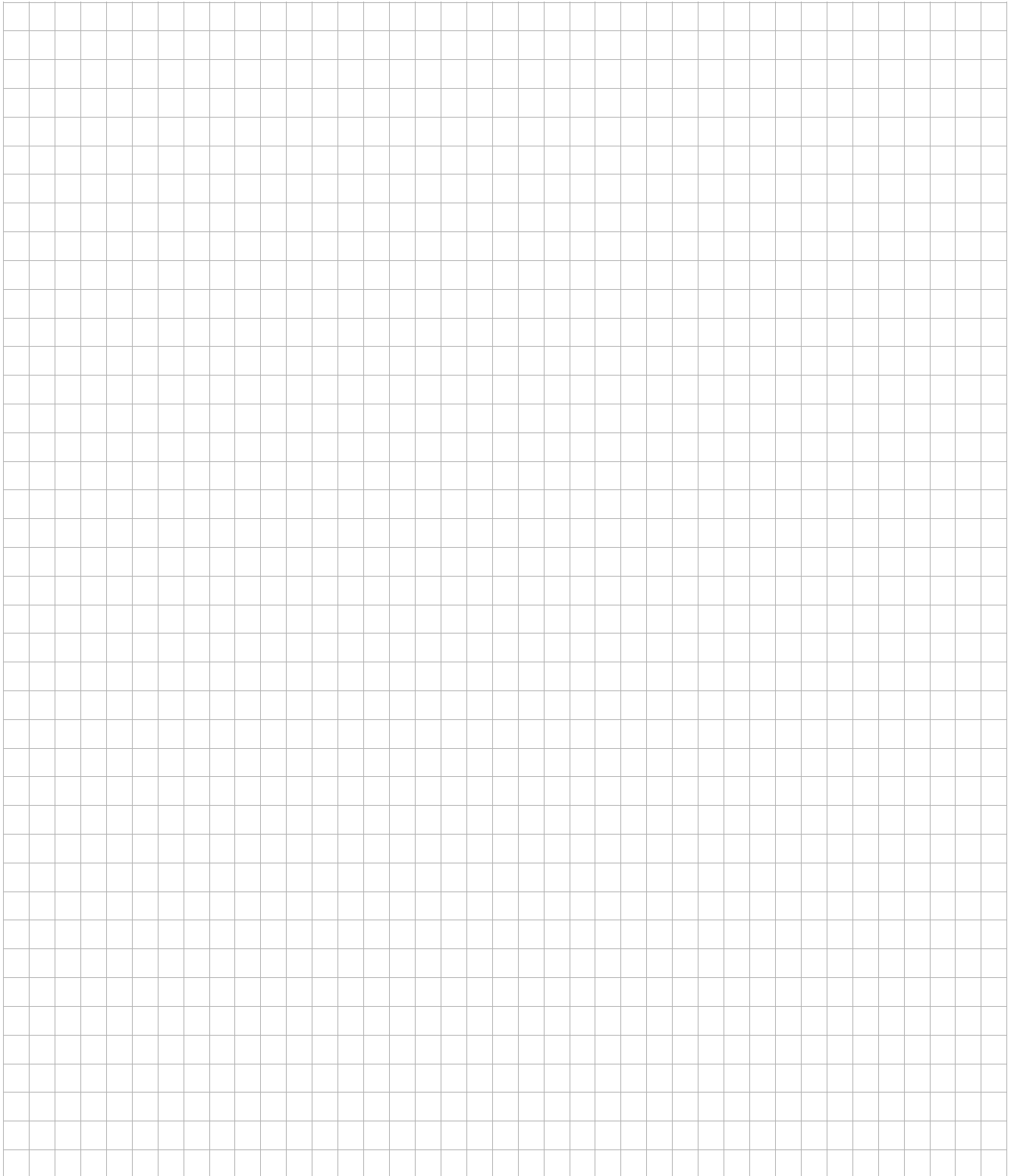
## Address List

| Slovakia                      |                        |                                                                                                                                                                           |                                                                                                                                                    |
|-------------------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | <b>Banská Bystrica</b> | SEW-Eurodrive SK s.r.o.<br>Rudlovská cesta 85<br>SK-974 11 Banská Bystrica                                                                                                | Tel. +421 48 414 6564<br>Fax +421 48 414 6566<br>sew@sew-eurodrive.sk                                                                              |
|                               | <b>Košice</b>          | SEW-Eurodrive SK s.r.o.<br>Slovenská ulica 26<br>SK-040 01 Košice                                                                                                         | Tel. +421 55 671 2245<br>Fax +421 55 671 2254<br>sew@sew-eurodrive.sk                                                                              |
| Slovenia                      |                        |                                                                                                                                                                           |                                                                                                                                                    |
| <b>Sales Service</b>          | <b>Celje</b>           | Pakman - Pogonska Tehnika d.o.o.<br>Ul. XIV. divizije 14<br>SLO - 3000 Celje                                                                                              | Tel. +386 3 490 83-20<br>Fax +386 3 490 83-21<br>pakman@siol.net                                                                                   |
| South Africa                  |                        |                                                                                                                                                                           |                                                                                                                                                    |
| <b>Assembly Sales Service</b> | <b>Johannesburg</b>    | SEW-EURODRIVE (PROPRIETARY) LIMITED<br>Eurodrive House<br>Cnr. Adcock Ingram and Aerodrome Roads<br>Aeroton Ext. 2<br>Johannesburg 2013<br>P.O.Box 90004<br>Bertsham 2013 | Tel. +27 11 248-7000<br>Fax +27 11 494-3104<br><a href="http://www.sew.co.za">http://www.sew.co.za</a><br>info@sew.co.za                           |
|                               | <b>Cape Town</b>       | SEW-EURODRIVE (PROPRIETARY) LIMITED<br>Rainbow Park<br>Cnr. Racecourse & Omuramba Road<br>Montague Gardens<br>Cape Town<br>P.O.Box 36556<br>Chempet 7442<br>Cape Town     | Tel. +27 21 552-9820<br>Fax +27 21 552-9830<br>Telex 576 062<br>jhainsworth@sew.co.za                                                              |
|                               | <b>Durban</b>          | SEW-EURODRIVE (PROPRIETARY) LIMITED<br>2 Monaceo Place<br>Pinetown<br>Durban<br>P.O. Box 10433, Ashwood 3605                                                              | Tel. +27 31 700-3451<br>Fax +27 31 700-3847<br>hengela@sew.co.za                                                                                   |
| Spain                         |                        |                                                                                                                                                                           |                                                                                                                                                    |
| <b>Assembly Sales Service</b> | <b>Bilbao</b>          | SEW-EURODRIVE ESPAÑA, S.L.<br>Parque Tecnológico, Edificio, 302<br>E-48170 Zamudio (Vizcaya)                                                                              | Tel. +34 94 43184-70<br>Fax +34 94 43184-71<br><a href="http://www.sew-eurodrive.es">http://www.sew-eurodrive.es</a><br>sew.spain@sew-eurodrive.es |
| Sweden                        |                        |                                                                                                                                                                           |                                                                                                                                                    |
| <b>Assembly Sales Service</b> | <b>Jönköping</b>       | SEW-EURODRIVE AB<br>Gnejsvägen 6-8<br>S-55303 Jönköping<br>Box 3100 S-55003 Jönköping                                                                                     | Tel. +46 36 3442 00<br>Fax +46 36 3442 80<br><a href="http://www.sew-eurodrive.se">http://www.sew-eurodrive.se</a><br>info@sew-eurodrive.se        |
| Switzerland                   |                        |                                                                                                                                                                           |                                                                                                                                                    |
| <b>Assembly Sales Service</b> | <b>Basel</b>           | Alfred Imhof A.G.<br>Jurastrasse 10<br>CH-4142 Münchenstein bei Basel                                                                                                     | Tel. +41 61 417 1717<br>Fax +41 61 417 1700<br><a href="http://www.imhof-sew.ch">http://www.imhof-sew.ch</a><br>info@imhof-sew.ch                  |
| Thailand                      |                        |                                                                                                                                                                           |                                                                                                                                                    |
| <b>Assembly Sales Service</b> | <b>Chonburi</b>        | SEW-EURODRIVE (Thailand) Ltd.<br>700/456, Moo.7, Donhuaroh<br>Muang<br>Chonburi 20000                                                                                     | Tel. +66 38 454281<br>Fax +66 38 454288<br>sewthailand@sew-eurodrive.com                                                                           |



|                                                                            |                             |                                                                                                                                    |                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Tunisia</b>                                                             |                             |                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| <b>Sales</b>                                                               | <b>Tunis</b>                | T. M.S. Technic Marketing Service<br>5, Rue El Houdaibiah<br>1000 Tunis                                                            | Tel. +216 71 4340-64 + 71 4320-29<br>Fax +216 71 4329-76<br>tms@tms.com.tn                                                                                                                                                                                         |
| <b>Turkey</b>                                                              |                             |                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| <b>Assembly<br/>Sales<br/>Service</b>                                      | <b>Istanbul</b>             | SEW-EURODRIVE<br>Hareket Sistemleri San. ve Tic. Ltd. Sti.<br>Bagdat Cad. Koruma Cikmazi No. 3<br>TR-34846 Maltepe ISTANBUL        | Tel. +90 216 4419164, 3838014,<br>3738015<br>Fax +90 216 3055867<br><a href="http://www.sew-eurodrive.com.tr">http://www.sew-eurodrive.com.tr</a><br>sew@sew-eurodrive.com.tr                                                                                      |
| <b>Ukraine</b>                                                             |                             |                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| <b>Sales<br/>Service</b>                                                   | <b>Dnepropetrovsk</b>       | SEW-EURODRIVE<br>Str. Rabochaja 23-B, Office 409<br>49008 Dnepropetrovsk                                                           | Tel. +380 56 370 3211<br>Fax +380 56 372 2078<br><a href="http://www.sew-eurodrive.ua">http://www.sew-eurodrive.ua</a><br>sew@sew-eurodrive.ua                                                                                                                     |
| <b>USA</b>                                                                 |                             |                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| <b>Production<br/>Assembly<br/>Sales<br/>Service<br/>Corporate Offices</b> | <b>Southeast<br/>Region</b> | SEW-EURODRIVE INC.<br>1295 Old Spartanburg Highway<br>P.O. Box 518<br>Lyman, S.C. 29365                                            | Tel. +1 864 439-7537<br>Fax Sales +1 864 439-7830<br>Fax Manufacturing +1 864 439-9948<br>Fax Assembly +1 864 439-0566<br>Fax Confidential/HR +1 864 949-5557<br><a href="http://www.seweurodrive.com">http://www.seweurodrive.com</a><br>cslyman@seweurodrive.com |
| <b>Assembly<br/>Sales<br/>Service</b>                                      | <b>Northeast<br/>Region</b> | SEW-EURODRIVE INC.<br>Pureland Ind. Complex<br>2107 High Hill Road, P.O. Box 481<br>Bridgeport, New Jersey 08014                   | Tel. +1 856 467-2277<br>Fax +1 856 845-3179<br>csbridgeport@seweurodrive.com                                                                                                                                                                                       |
|                                                                            | <b>Midwest Region</b>       | SEW-EURODRIVE INC.<br>2001 West Main Street<br>Troy, Ohio 45373                                                                    | Tel. +1 937 335-0036<br>Fax +1 937 440-3799<br>cstroy@seweurodrive.com                                                                                                                                                                                             |
|                                                                            | <b>Southwest<br/>Region</b> | SEW-EURODRIVE INC.<br>3950 Platinum Way<br>Dallas, Texas 75237                                                                     | Tel. +1 214 330-4824<br>Fax +1 214 330-4724<br>csdallas@seweurodrive.com                                                                                                                                                                                           |
|                                                                            | <b>Western Region</b>       | SEW-EURODRIVE INC.<br>30599 San Antonio St.<br>Hayward, CA 94544                                                                   | Tel. +1 510 487-3560<br>Fax +1 510 487-6433<br>cshayward@seweurodrive.com                                                                                                                                                                                          |
| Additional addresses for service in the USA provided on request!           |                             |                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| <b>Venezuela</b>                                                           |                             |                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| <b>Assembly<br/>Sales<br/>Service</b>                                      | <b>Valencia</b>             | SEW-EURODRIVE Venezuela S.A.<br>Av. Norte Sur No. 3, Galpon 84-319<br>Zona Industrial Municipal Norte<br>Valencia, Estado Carabobo | Tel. +58 241 832-9804<br>Fax +58 241 838-6275<br><a href="http://www.sew-eurodrive.com.ve">http://www.sew-eurodrive.com.ve</a><br>ventas@sew-eurodrive.com.ve<br>sewfinanzas@cantv.net                                                                             |





## How we're driving the world

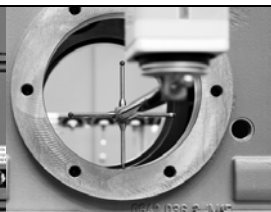
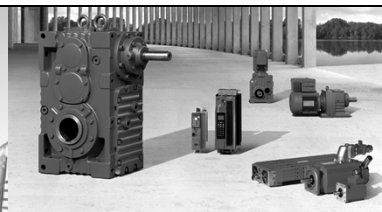
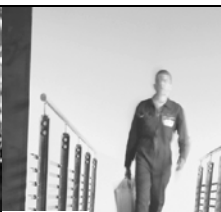
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